

SEQUENCE LISTING

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<120> Recombinant Immunogens for the Generation of Antivenoms to the
Venom of Scorpions of the Genus Centruroides

<130> 2099.0070001

<150> US 60/430,067

<151> 2002-12-02

<160> 294

<170> PatentIn version 3.1

<210> 1
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<212> DNA
<213> Centruroides exilicauda

<220>
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<222> (4)..(264)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
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<223> Product= Sodium-channel modifier toxin

<220>
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<222> (268)..(299)
<223>

<400> 1
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Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly
-15 -10 -5

aca gtg tgg gca aag gaa ggt tat ctg gta agc aag agc acg ggc tgc 96
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys

	-1	1		5		10	
aaa tac gag tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa							144
Lys Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu							
	15			20		25	
tgc aaa gcg ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc							192
Cys Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe							
	30			35		40	
gca tgc tgg tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att							240
Ala Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile							
	45			50		55	60
cct ggt aat gaa aac gac ttt tta ttgtccacca acagaaatat tgtaacgctt							294
Pro Gly Asn Glu Asn Asp Phe Leu							
				65			
cttaa							299

<210> 2
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 <212> PRT
 <213> Centruroides exilicauda

<400> 2

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly Thr																
				-15				-10								-5

Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys																
	-1	1					5						10			

Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys																
	15					20				25						

Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala																
	30				35				40							45

Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro																
				50					55						60	

Gly Asn Glu Asn Asp Phe Leu						
				65		

<210> 3
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 <212> DNA
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<220>
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 <223> Product= Sodium-channel modifier toxin

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<400> 3
aag gaa ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag tgc      48
Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1          5          10          15

ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg      96
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
          20          25          30

aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc      144
Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
          35          40          45

gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca      192
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
          50          55          60

tgc      195
Cys
65

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<210> 4
<211> 65
<212> PRT
<213> Centruroides exilicauda

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<400> 4

Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1          5          10          15

Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
          20          25          30

Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
          35          40          45

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
          50          55          60

Cys
65

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<210> 5
<211> 317
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (4)..(264)
<223> Product= Sodium-channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

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<220>
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 <222> (268)..(317)
 <223>

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 <223>

<220>
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 <222> (61)..()
 <223> Product= Sodium-channel modifier toxin

<220>
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<400> 5
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 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly
 -15 -10 -5
 aca gtg tgg gca aag gaa ggt tat ctg gta agc aag agc acg ggc tgc 96
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys
 -1 1 5 10
 aaa tac gag tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa 144
 Lys Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu
 15 20 25
 tgc aaa gcg ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc 192
 Cys Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe
 30 35 40
 gca tgc tgg tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att 240
 Ala Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
 45 50 55 60
 cct ggt aaa tca tgc ggc aaa aaa taatgaaaac gacttttttat tgtccaccaa 294
 Pro Gly Lys Ser Cys Gly Lys Lys
 65
 cagaaatatt gtaacgcttc taa 317

<210> 6
 <211> 87
 <212> PRT
 <213> Centruroides exilicauda

<400> 6
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly Thr
 -15 -10 -5
 Val Trp Ala Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys
 -1 1 5 10

Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys
15 20 25

Lys Ala Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala
30 35 40 45

Cys Trp Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro
50 55 60

Gly Lys Ser Cys Gly Lys Lys
65

<210> 7
<211> 195
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(195)
<223> Product= Sodium-channel modifier toxin

<400> 7
aag gaa ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag tgc 48
Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg 96
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
20 25 30

aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
35 40 45

gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca 192
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
50 55 60

tgc 195
Cys
65

<210> 8
<211> 65
<212> PRT
<213> Centruroides exilicauda

<400> 8

Lys Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro

			20					25					30				
Asn	Gln	Gly	Gly	Gly	Tyr	Gly	Tyr	Cys	His	Ala	Phe	Ala	Cys	Trp	Cys		
		35					40					45					

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
50 55 60

Cys
65

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<210> 9
<211> 313
<212> DNA
<213> Centruroides exilicauda
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<220>
<221> CDS
<222> (4)..(255)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last 2 basic aminoacids are cut
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<220>
<221>    3'UTR
<222>    (259) .. (313)
<223>
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<220>
<221>   sig_peptide
<222>   (4) .. (60)
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<220>
<221> mat_peptide
<222> (61)..()
<223> Product= Sodium-channel modifier toxin
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<400> 9
aag atg aac tcg ttg ttg atg atc act act tgt ttg att cta gtc ggt      48
      Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Val Gly
              -15                      -10                      -5

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acc gtg tgg gca aac gat ggt tat ttg ttt gac aag aga aag cgc tgc 96
Thr Val Trp Ala Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys
-1 1 5 10

aca ctc gaa tgc ata gac aag aca gga gac aaa aat tgc gat aga aat 144
Thr Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn
15 20 25

tgc aag aag gaa gga ggt agt ttt ggc aaa tgc tct tat tct gca tgc 192
Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys
30 35 40

tg	gc	aaa	gga	ttg	ccc	gga	att	aca	ccg	att	tca	cgt	act	cct	ggt	240
Trp	Cys	Lys	Gly	Leu	Pro	Gly	Ile	Thr	Pro	Ile	Ser	Arg	Thr	Pro	Gly	

45	50	55	60	
aaa aca tgt aga aaa	taatggcaac	ttgtttttat	tgtgcaccaa	cagaaatatt 295
Lys Thr Cys Arg Lys				
65				
gtaacgcttc ttaattgc				313

<210> 10
 <211> 84
 <212> PRT
 <213> Centruroides exilicauda

<400> 10

Met Asn Ser Leu	Leu Met Ile Thr Thr	Cys Leu Ile Leu Val	Gly Thr
	-15	-10	-5

Val Trp Ala Asn Asp	Gly Tyr Leu Phe Asp	Lys Arg Lys Arg Cys Thr
-1 1	5	10

Leu Glu Cys Ile Asp	Lys Thr Gly Asp	Lys Asn Cys Asp Arg Asn Cys
15	20	25

Lys Lys Glu Gly Gly	Ser Phe Gly Lys Cys	Ser Tyr Ser Ala Cys Trp
30	35	40 45

Cys Lys Gly Leu Pro	Gly Ile Thr Pro	Ile Ser Arg Thr Pro Gly Lys
50	55	60

Thr Cys Arg Lys
65

<210> 11
 <211> 249
 <212> DNA
 <213> Centruroides exilicauda

<220>
 <221> CDS
 <222> (1)..(249)
 <223> Product= Sodium-channel modifier toxin

<400> 11	
aag atg aac tcg ttg ttg atg atc act act tgt ttg att cta gtc ggt	48
Lys Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Val Gly	
1 5 10 15	

acc gtg tgg gca aac gat ggt tat ttg ttt gac aag aga aag cgc tgc	96
Thr Val Trp Ala Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys	
20 25 30	

aca ctc gaa tgc ata gac aag aca gga gac aaa aat tgc gat aga aat	144
Thr Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn	

	35	40	45	
tgc aag aag gaa gga ggt agt ttt ggc aaa tgc tct tat tct gca tgc				192
Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys				
50		55	60	
tggtgc aaa gga ttg ccc gga att aca ccg att tca cgt act cct ggt				240
Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly				
65	70	75	80	
aaa aca tgt				249
Lys Thr Cys				

<210> 12
 <211> 83
 <212> PRT
 <213> Centruroides exilicauda

<400> 12

Lys Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Val Gly
1 5 10 15

Thr Val Trp Ala Asn Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys
20 25 30

Thr Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn
35 40 45

Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Ser Ala Cys
50 55 60

Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly
65 70 75 80

Lys Thr Cys

<210> 13
 <211> 273
 <212> DNA
 <213> Centruroides exilicauda

<220>
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 <222> (1)..(219)
 <223> Product= Sodium-channel modifier toxin precursor

<220>
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 <222> (223)..(273)
 <223>

<220>
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 <222> (22)..()
 <223> Product= Sodium-channel modifier toxin

<220>
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 <222> (1)..(21)
 <223> Carboxy term of signal peptide

<400> 13
 gct aca gga aat gtg tgg gca aag gac ggt tat ctg gtg atc att aaa 48
 Ala Thr Gly Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Ile Ile Lys
 -5 -1 1 5
 acg ggc tgc aaa tac aat tgc tat ata ttg gga aaa aac aaa tac tgc 96
 Thr Gly Cys Lys Tyr Asn Cys Tyr Ile Leu Gly Lys Asn Lys Tyr Cys
 10 15 20 25
 aat tcg gaa tgc aaa gag gta ggt gct ggt tac ggc tat tgc tat gct 144
 Asn Ser Glu Cys Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala
 30 35 40
 ttt ggg tgc tgg tgc gaa gga tta ccc gaa agt ata ccg acc tgg ccc 192
 Phe Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Ile Pro Thr Trp Pro
 45 50 55
 ctt cct gat aaa aca tgt ggc aca aaa taatggcaac gtctttttat 239
 Leu Pro Asp Lys Thr Cys Gly Thr Lys
 60 65
 tgtccaccaa cagaaatatt gtaacgcttc ttaa 273

<210> 14
 <211> 73
 <212> PRT
 <213> Centruroides exilicauda

<400> 14
 Ala Thr Gly Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Ile Ile Lys
 -5 -1 1 5
 Thr Gly Cys Lys Tyr Asn Cys Tyr Ile Leu Gly Lys Asn Lys Tyr Cys
 10 15 20 25
 Asn Ser Glu Cys Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala
 30 35 40
 Phe Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Ile Pro Thr Trp Pro
 45 50 55
 Leu Pro Asp Lys Thr Cys Gly Thr Lys
 60 65

<210> 15
 <211> 219
 <212> DNA
 <213> Centruroides exilicauda

<220>
 <221> CDS
 <222> (1)..(219)
 <223> Product= Sodium-channel modifier toxin

<400> 15
 gct aca gga aat gtg tgg gca aag gac ggt tat ctg gtg atc att aaa 48
 Ala Thr Gly Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Ile Ile Lys
 1 5 10 15
 acg ggc tgc aaa tac aat tgc tat ata ttg gga aaa aac aaa tac tgc 96
 Thr Gly Cys Lys Tyr Asn Cys Tyr Ile Leu Gly Lys Asn Lys Tyr Cys
 20 25 30
 aat tcg gaa tgc aaa gag gta ggt gct ggt tac ggc tat tgc tat gct 144
 Asn Ser Glu Cys Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala
 35 40 45
 ttt ggg tgc tgg tgc gaa gga tta ccc gaa agt ata ccg acc tgg ccc 192
 Phe Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Ile Pro Thr Trp Pro
 50 55 60
 ctt cct gat aaa aca tgt ggc aca aaa 219
 Leu Pro Asp Lys Thr Cys Gly Thr Lys
 65 70

<210> 16
 <211> 73
 <212> PRT
 <213> Centruroides exilicauda

<400> 16
 Ala Thr Gly Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Ile Ile Lys
 1 5 10 15
 Thr Gly Cys Lys Tyr Asn Cys Tyr Ile Leu Gly Lys Asn Lys Tyr Cys
 20 25 30
 Asn Ser Glu Cys Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala
 35 40 45
 Phe Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Ile Pro Thr Trp Pro
 50 55 60
 Leu Pro Asp Lys Thr Cys Gly Thr Lys
 65 70

<210> 17
 <211> 261

<400> 18

Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala
20 25 30

Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp
35 40 45

Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys
50 55 60

Ser Cys Gly Arg Lys
65

<210> 19
<211> 204
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(204)
<223> Product= Sodium-channel modifier toxin

<400> 19
aag gat ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc 48
Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg aag 96
Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa tca 192
Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

tgc ggc aga aaa 204
Cys Gly Arg Lys
65

<210> 20
<211> 68
<212> PRT
<213> Centruroides exilicauda

<400> 20

Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
 35 40 45

Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60

Cys Gly Arg Lys
 65

<210> 21
 <211> 314
 <212> DNA
 <213> Centruroides exilicauda

<220>
 <221> mat_peptide
 <222> (58)..()
 <223> Product= Sodium-channel modifier toxin
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (265)..(314)
 <223>

<220>
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 <222> (1)..(57)
 <223>

<220>
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 <222> (1)..(261)
 <223> Product= Sodium-channel modifier toxin precursor

<400> 21
 atg aat tcg ttg ttg atg atc act gct tgt ttg ttc ctg atc gga aca 48
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr
 -15 -10 -5
 gtg tgg gca aag gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa 96
 Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
 -1 1 5 10
 tac gag tgc ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc 144
 Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys
 15 20 25
 aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca 192
 Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala
 30 35 40 45
 tgc tgg tgc gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct 240
 Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro
 50 55 60

aat aaa tca tgc ggc aga aaa taatggcaaa gactttttat tgtccatcaa 291
Asn Lys Ser Cys Gly Arg Lys
65

cagaaatatt gtaacgcttc tta 314

<210> 22
<211> 87
<212> PRT
<213> Centruroides exilicauda

<400> 22

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Glu Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro
50 55 60

Asn Lys Ser Cys Gly Arg Lys
65

<210> 23
<211> 195
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(195)
<223> Product= Sodium-channel modifier toxin

<400> 23
aag gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc 48
Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg aag 96
Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa tca 192
 Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60

tgc 195
 Cys
 65

<210> 24
 <211> 65
 <212> PRT
 <213> Centruroides exilicauda

<400> 24

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
 1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys
 20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
 35 40 45

Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60

Cys
 65

<210> 25
 <211> 261
 <212> DNA
 <213> Centruroides exilicauda

<220>
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 <222> (1)..(207)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (211)..(261)
 <223>

<220>
 <221> mat_peptide
 <222> (4)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide

<222> (1)..(3)

<223> Carboxy-end of the signal peptide

<400> 25

gca aag gac ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag	48
Ala Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu	
-1 1 5 10 15	

tgc ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg	96
Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala	
20 25 30	

ccg aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg	144
Pro Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp	
35 40 45	

tgc gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa	192
Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys	
50 55 60	

tca tgc ggc aaa aaa taatgaaaac gactttttat tgtcctccaa cagaaatatt	247
Ser Cys Gly Lys Lys	
65	

gtaacgcttc ttaa	261
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<210> 26

<211> 69

<212> PRT

<213> Centruroides exilicauda

<400> 26

Ala Lys Asp Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu
-1 1 5 10 15

Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala
20 25 30

Pro Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp
35 40 45

Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys
50 55 60

Ser Cys Gly Lys Lys
65

<210> 27

<211> 195

<212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(195)

<223> Product= Sodium-channel modifier toxin

<400> 27

aag	gac	ggt	tat	ctg	gta	agc	aag	agc	acg	ggc	tgc	aaa	tac	gag	tgc	48
Lys	Asp	Gly	Tyr	Leu	Val	Ser	Lys	Ser	Thr	Gly	Cys	Lys	Tyr	Glu	Cys	
1				5					10					15		

ttt	tgg	ttg	gga	aaa	aac	gaa	ggc	tgc	gat	aag	gaa	tgc	aaa	gcg	ccg	96
Phe	Trp	Leu	Gly	Lys	Asn	Glu	Gly	Cys	Asp	Lys	Glu	Cys	Lys	Ala	Pro	
			20					25					30			

aac	caa	gga	ggt	ggt	tac	ggc	tat	tgc	cac	gct	ttc	gca	tgc	tgg	tgc	144
Asn	Gln	Gly	Gly	Gly	Tyr	Gly	Tyr	Cys	His	Ala	Phe	Ala	Cys	Trp	Cys	
		35					40					45				

gaa	aat	ttg	ccc	gaa	agt	aca	ccg	act	tat	ccc	att	cct	ggt	aaa	tca	192
Glu	Asn	Leu	Pro	Glu	Ser	Thr	Pro	Thr	Tyr	Pro	Ile	Pro	Gly	Lys	Ser	
	50					55					60					

tgc																195
Cys																
65																

<210> 28

<211> 65

<212> PRT

<213> Centruroides exilicauda

<400> 28

Lys	Asp	Gly	Tyr	Leu	Val	Ser	Lys	Ser	Thr	Gly	Cys	Lys	Tyr	Glu	Cys
1				5					10					15	

Phe	Trp	Leu	Gly	Lys	Asn	Glu	Gly	Cys	Asp	Lys	Glu	Cys	Lys	Ala	Pro
			20					25					30		

Asn	Gln	Gly	Gly	Gly	Tyr	Gly	Tyr	Cys	His	Ala	Phe	Ala	Cys	Trp	Cys
		35					40					45			

Glu	Asn	Leu	Pro	Glu	Ser	Thr	Pro	Thr	Tyr	Pro	Ile	Pro	Gly	Lys	Ser
	50					55					60				

Cys
65

<210> 29

<211> 261

<212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(207)

<223> Product= Sodium-channel modifier toxin precursor

In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (211)..(261)
<223>

<220>
<221> sig_peptide
<222> (1)..(3)
<223> Carboxy-end of the signal peptide

<220>
<221> mat_peptide
<222> (4)..()
<223> Product= Sodium-channel modifier toxin

<400> 29
gca agg gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag 48
Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu
-1 1 5 10 15
tgc ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg 96
Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala
20 25 30
aag aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg 144
Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp
35 40 45
tgc gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa 192
Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys
50 55 60
tca tgc ggc aga aaa taatggcaaa gactttttat tgtccatcaa cagaaatatt 247
Ser Cys Gly Arg Lys
65
gtaacgcttc ttaa 261

<210> 30
<211> 69
<212> PRT
<213> Centruroides exilicauda

<400> 30
Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu
-1 1 5 10 15
Cys Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala
20 25 30
Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp
35 40 45

Cys Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys
 50 55 60

Ser Cys Gly Arg Lys
 65

<210> 31
 <211> 195
 <212> DNA
 <213> Centruroides exilicauda
 <220>
 <221> CDS
 <222> (1)..(195)
 <223> Product= Sodium-channel modifier toxin

<400> 31
 agg gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gag tgc 48
 Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
 1 5 10 15
 ttt tgg ttg gga aaa aac gaa ttc tgc gat aag gaa tgc aaa gcg aag 96
 Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys
 20 25 30
 aac caa gga ggt agt tac ggc tat tgc tac tct ttc gca tgc tgg tgc 144
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
 35 40 45
 gaa ggt ttg ccc gaa agt aca tcg act tat cct ctt cct aat aaa tca 192
 Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60
 tgc 195
 Cys
 65

<210> 32
 <211> 65
 <212> PRT
 <213> Centruroides exilicauda

<400> 32
 Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Glu Cys
 1 5 10 15
 Phe Trp Leu Gly Lys Asn Glu Phe Cys Asp Lys Glu Cys Lys Ala Lys
 20 25 30
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
 35 40 45
 Glu Gly Leu Pro Glu Ser Thr Ser Thr Tyr Pro Leu Pro Asn Lys Ser

$\langle 210 \rangle$	34
$\langle 211 \rangle$	69

<212> PRT
<213> Centruroides exilicauda

<400> 34

Ala Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu
-1 1 5 10 15

Cys Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala
20 25 30

Pro Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp
35 40 45

Cys Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys
50 55 60

Ser Cys Gly Lys Lys
65

<210> 35
<211> 195
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(195)
<223> Product= Sodium-channel modifier toxin

<400> 35
agg gag ggt tat ctg gta agc aag agc acg ggc tgc aaa tac gag tgc 48
Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

ttt tgg ttg gga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg ccg 96
Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
20 25 30

aac caa gga ggt ggt tac ggc tat tgc cac gct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
35 40 45

gaa aat ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca 192
Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
50 55 60

tgc 195
Cys
65

<210> 36
<211> 65
<212> PRT
<213> Centruroides exilicauda

<400> 36

Arg Glu Gly Tyr Leu Val Ser Lys Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Pro
20 25 30

Asn Gln Gly Gly Gly Tyr Gly Tyr Cys His Ala Phe Ala Cys Trp Cys
35 40 45

Glu Asn Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser
50 55 60

Cys
65

<210> 37

<211> 254

<212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(201)

<223> Product= Sodium-channel modifier toxin precursor

In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>

<221> 3'UTR

<222> (205)..(254)

<223>

<220>

<221> sig_peptide

<222> (1)..(3)

<223> Carboxy-end of the signal peptide

<220>

<221> mat_peptide

<222> (4)..()

<223> Product= Sodium-channel modifier toxin

<400> 37

gca aag gaa ggt tat ctg gtg aac ata tac acg ggc tgc aaa tac agt 48
Ala Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser
-1 1 5 10 15

tgc tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag 96
Cys Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu
20 25 30

ata gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa 144

```

Ile Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu
      35              40              45

caa ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc      192
Gln Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
      50              55              60

ggc aga aaa taagtaacgt ctttttattg tctgcgcaaa agaattattg      241
Gly Arg Lys
      65

taacgcttct taa      254

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<210> 38
<211> 67
<212> PRT
<213> Centruroides exilicauda

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<400> 38

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Ala Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser
-1  1              5              10              15

```

```

Cys Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu
      20              25              30

```

```

Ile Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu
      35              40              45

```

```

Gln Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
      50              55              60

```

```

Gly Arg Lys
      65

```

```

<210> 39
<211> 189
<212> DNA
<213> Centruroides exilicauda

```

```

<220>
<221> CDS
<222> (1)..(189)
<223> Product= Sodium-channel modifier toxin

```

```

<400> 39
aag gaa ggt tat ctg gtg aac ata tac acg ggc tgc aaa tac agt tgc      48
Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
1              5              10              15

```

```

tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata      96
Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
      20              25              30

```

```

gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa      144

```

Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
 35 40 45

ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc 189
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
 50 55 60

<210> 40
 <211> 63
 <212> PRT
 <213> Centruroides exilicauda
 <400> 40

Lys Glu Gly Tyr Leu Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
 1 5 10 15

Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
 20 25 30

Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
 35 40 45

Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
 50 55 60

<210> 41
 <211> 254
 <212> DNA
 <213> Centruroides exilicauda

<220>
 <221> CDS
 <222> (1)..(204)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (205)..(254)
 <223>

<400> 41
 aag gac ggt tat ccg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48
 Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
 1 5 10 15

aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96
 Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
 20 25 30

cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144
 Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
 35 40 45

gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

ggc aaa aaa taa tggcaacgct gttctattgg ccaccaacgg aaatatttaa 244
Gly Lys Lys
65

cgcttcttaa 254

<210> 42
<211> 67
<212> PRT
<213> Centruroides exilicauda

<400> 42

Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1 5 10 15

Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
20 25 30

Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
35 40 45

Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

Gly Lys Lys
65

<210> 43
<211> 192
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<400> 43
aag gac ggt tat ccg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48
Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1 5 10 15

aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
20 25 30

cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
35 40 45

gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

<210> 44
<211> 64
<212> PRT
<213> Centruroides exilicauda

<400> 44

Lys Asp Gly Tyr Pro Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1 5 10 15

Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
20 25 30

Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
35 40 45

Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

<210> 45
<211> 258
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(204)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (205)..(258)
<223>

<400> 45
aag gac ggt tat ctg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48
Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1 5 10 15

aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
20 25 30

cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
35 40 45

gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

ggc aaa aaa taa tggcaacgct gttctattgg ccaccaacgg aaatatttaa 244
Gly Lys Lys
65

cgctttcttaa ttgc 258

<210> 46
<211> 67
<212> PRT
<213> Centruroides exilicauda

<400> 46

Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1 5 10 15

Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
20 25 30

Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
35 40 45

Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

Gly Lys Lys
65

<210> 47
<211> 192
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<400> 47
aag gac ggt tat ctg gtg gag gtc acg ggc tgc aaa aag tct tgc tat 48
Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
1 5 10 15

aaa ttg gga gaa aac aaa ttc tgc aat agg gaa tgc aaa atg aag cac 96
Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
20 25 30

cga gga ggt agt tac ggc tat tgc tat ttt ttt ggg tgc tat tgc gaa 144
Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
35 40 45

gga ttg gcc gaa agt aca ccg act tgg ccc ctt cct aat aaa tca tgc 192
Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
50 55 60

<210> 48
 <211> 64
 <212> PRT
 <213> Centruroides exilicauda

<400> 48

Lys Asp Gly Tyr Leu Val Glu Val Thr Gly Cys Lys Lys Ser Cys Tyr
 1 5 10 15

Lys Leu Gly Glu Asn Lys Phe Cys Asn Arg Glu Cys Lys Met Lys His
 20 25 30

Arg Gly Gly Ser Tyr Gly Tyr Cys Tyr Phe Phe Gly Cys Tyr Cys Glu
 35 40 45

Gly Leu Ala Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser Cys
 50 55 60

<210> 49
 <211> 252
 <212> DNA
 <213> Centruroides exilicauda

<220>
 <221> CDS
 <222> (1)..(201)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (202)..(252)
 <223>

<400> 49
 aag gag ggt tat ccg gtg aac ata tac acg ggc tgc aaa tac agt tgc 48
 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
 1 5 10 15

tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata 96
 Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
 20 25 30

gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa 144
 Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
 35 40 45

ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc ggc 192
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys Gly
 50 55 60

aga aaa taa tagcaacgtc tttttattgt ctgccaaaag aattattgta 241
 Arg Lys
 65

acgcttctta a

252

<210> 50
 <211> 66
 <212> PRT
 <213> Centruroides exilicauda
 <400> 50

Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
 1 5 10 15

Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
 20 25 30

Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
 35 40 45

Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys Gly
 50 55 60

Arg Lys
 65

<210> 51
 <211> 189
 <212> DNA
 <213> Centruroides exilicauda

<220>
 <221> CDS
 <222> (1)..(189)
 <223> Product= Sodium-channel modifier toxin

<400> 51
 aag gag ggt tat ccg gtg aac ata tac acg ggc tgc aaa tac agt tgc 48
 Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
 1 5 10 15

tgg ttg ttg gga gaa aac gaa tat tgc att gcg gaa tgc aaa gag ata 96
 Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
 20 25 30

gga gct ggt tac ggc tat tgc cac ggt ttt ggg tgc tgg tgc gaa caa 144
 Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
 35 40 45

ttt cca gaa aat aaa ccg tct tat ccc tat cct gaa aaa tca tgc 189
 Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
 50 55 60

<210> 52
 <211> 63
 <212> PRT

<213> Centruroides exilicauda

<400> 52

Lys Glu Gly Tyr Pro Val Asn Ile Tyr Thr Gly Cys Lys Tyr Ser Cys
1 5 10 15

Trp Leu Leu Gly Glu Asn Glu Tyr Cys Ile Ala Glu Cys Lys Glu Ile
20 25 30

Gly Ala Gly Tyr Gly Tyr Cys His Gly Phe Gly Cys Trp Cys Glu Gln
35 40 45

Phe Pro Glu Asn Lys Pro Ser Tyr Pro Tyr Pro Glu Lys Ser Cys
50 55 60

<210> 53

<211> 322

<212> DNA

<213> Centruroides limpidus limpidus'

<220>

<221> CDS

<222> (5)..(265)

<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Asn is amidated, and the last Gl
y and the last basic aminoacid are cut

<220>

<221> mat_peptide

<222> (62)..()

<223> Product= Sodium-channel modifier toxin'

<220>

<221> sig_peptide

<222> (5)..(61)

<223>

<220>

<221> 3'UTR

<222> (269)..(322)

<223>

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<400> 53

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc ctg gtc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly
-15 -10 -5

aca gtg tgg gca aag gaa ggt tat ctg gta aac cac tcc acg ggg tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys
-1 1 5 10

aaa tac gaa tgc tat aaa ttg gga gac aac gat tat tgc cta agg gaa 145
Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
15 20 25

tgc aaa cag cag tac gga aaa ggt gct ggt ggc tat tgc tac gct ttt 193
Cys Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe
30 35 40

ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
45 50 55 60

cct aag aaa aca tgc aac gga aaa taatggcaac gacttttttat tgtccaccaa 295
Pro Lys Lys Thr Cys Asn Gly Lys
65

cagaaatatt gtaacgcttc ttaattg 322

<210> 54

<211> 87

<212> PRT

<213> Centruroides limpidus limpidus

<400> 54

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys
15 20 25

Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly
30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro
50 55 60

Lys Lys Thr Cys Asn Gly Lys
65

<210> 55

<211> 198

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium-channel modifier toxin C114

<400> 55

aag gaa ggt tat ctg gta aac cac tcc acg ggg tgc aaa tac gaa tgc 48
Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

tat aaa ttg gga gac aac gat tat tgc cta agg gaa tgc aaa cag cag 96
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
20 25 30

tac gga aaa ggt gct ggt ggc tat tgc tac gct ttt ggg tgc tgg tgc 144
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45

aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aag aaa aca 192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Thr
50 55 60

tgc aac 198
Cys Asn
65

<210> 56

<211> 66

<212> PRT

<213> Centruroides limpidus limpidus

<400> 56

Lys Glu Gly Tyr Leu Val Asn His Ser Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
20 25 30

Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Thr
50 55 60

Cys Asn
65

<210> 57

<211> 322

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (5)..(265)

<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Tyr is amidated, and the last Gl
y and the last basic aminoacid are cut

<220>

<221> 3'UTR
<222> (269)..(322)
<223>

<220>
<221> 5'UTR
<222> (1)..(4)
<223>

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223>

<400> 57
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc gtg atc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Val Ile Gly
-15 -10 -5

aca gtg tgg gca aag gaa ggt tat att gta aac tac tac gat ggc tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys
-1 1 5 10

aaa tac gca tgt ctt aaa tta gga gag aac gat tat tgc tta agg gaa 145
Lys Tyr Ala Cys Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu
15 20 25

tgc aaa gcg aga tac tac aaa tct gct ggc ggc tat tgc tac gct ttt 193
Cys Lys Ala Arg Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe
30 35 40

gcg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241
Ala Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
45 50 55 60

cct aat aaa aca tgc tac gga aaa taatggcaac gactttttat tgtccaccaa 295
Pro Asn Lys Thr Cys Tyr Gly Lys
65

cagaaatatt gtaacgcttc ttaattg 322

<210> 58
<211> 87
<212> PRT
<213> Centruroides limpidus limpidus

<400> 58
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Val Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys Lys
-1 1 5 10

Tyr Ala Cys Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu Cys
15 20 25

Lys Ala Arg Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe Ala
30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro
50 55 60

Asn Lys Thr Cys Tyr Gly Lys
65

<210> 59

<211> 198

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium-channel modifier toxin

<400> 59

aag gaa ggt tat att gta aac tac tac gat ggc tgc aaa tac gca tgt 48
Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys Lys Tyr Ala Cys
1 5 10 15

ctt aaa tta gga gag aac gat tat tgc tta agg gaa tgc aaa gcg aga 96
Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu Cys Lys Ala Arg
20 25 30

tac tac aaa tct gct ggc ggc tat tgc tac gct ttt gcg tgc tgg tgc 144
Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aat aaa aca 192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Asn Lys Thr
50 55 60

tgc tac 198
Cys Tyr
65

<210> 60

<211> 66

<212> PRT

<213> Centruroides limpidus limpidus

<400> 60

Lys Glu Gly Tyr Ile Val Asn Tyr Tyr Asp Gly Cys Lys Tyr Ala Cys
1 5 10 15

Leu Lys Leu Gly Glu Asn Asp Tyr Cys Leu Arg Glu Cys Lys Ala Arg
20 25 30

Tyr Tyr Lys Ser Ala Gly Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Asn Lys Thr
 50 55 60

Cys Tyr
 65

<210> 61
 <211> 322
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Asn is amidated, and the last Gl
 y and the last basic aminoacid are cut

<220>
 <221> 3'UTR
 <222> (269)..(322)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)
 <223>

<220>
 <221> mat_peptide
 <222> (62)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide
 <222> (5)..(61)
 <223>

<400> 61
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc ctg ata gga 49
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly
 -15 -10 -5

aca gtg tgg gca aag gaa ggt tat att gta aac tac cac gat ggc tgc 97
 Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys
 -1 1 5 10

aaa tac gaa tgc tat aaa ttg gga gac aac gat tat tgc tta agg gaa 145
 Lys Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
 15 20 25

tgc aaa ttg aga tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt 193
 Cys Lys Leu Arg Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe

30	35	40	
ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt			241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu			
45	50	55	60
cca aag aaa aga tgc aat gga aaa taatggcaac gactttttat tgtccaccaa			295
Pro Lys Lys Arg Cys Asn Gly Lys			
	65		
cagaaatatt gtaacgcttc ttaattg			322
<210>	62		
<211>	87		
<212>	PRT		
<213>	Centruroides limpidus limpidus		
<400>	62		
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly Thr			
	-15	-10	-5
Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys			
	-1 1	5	10
Tyr Glu Cys Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys			
	15	20	25
Lys Leu Arg Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly			
	30	35	40
Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro			
	50	55	60
Lys Lys Arg Cys Asn Gly Lys			
	65		
<210>	63		
<211>	198		
<212>	DNA		
<213>	Centruroides limpidus limpidus		
<220>			
<221>	CDS		
<222>	(1)..(198)		
<223>	Product= Sodium-channel modifier toxin		
<400>	63		
aag gaa ggt tat att gta aac tac cac gat ggc tgc aaa tac gaa tgc			48
Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys			
1	5	10	15
tat aaa ttg gga gac aac gat tat tgc tta agg gaa tgc aaa ttg aga			96
Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg			

	20	25	30	
tac gga aaa ggt gct ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc				144
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys				
	35	40	45	
aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt cca aag aaa aga				192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg				
	50	55	60	
tgc aat				198
Cys Asn				
65				

<210> 64
 <211> 66
 <212> PRT
 <213> Centruroides limpidus limpidus
 <400> 64

Lys Glu Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys
1 5 10 15

Tyr Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg
20 25 30

Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg
50 55 60

Cys Asn
 65

<210> 65
 <211> 322
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (269)..(322)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)

<223>

<220>

<221> mat_peptide

<222> (62)..()

<223> Product= Sodium-channel modifier toxin

<220>

<221> sig_peptide

<222> (5)..(61)

<223>

<400> 65

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gcc gag atc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Glu Ile Gly
-15 -10 -5

aca gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-1 1 5 10

aaa tac ggt tgc ttc tgg ttg gga aaa aac gaa aac tgc gat aag gaa 145
Lys Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu
15 20 25

tgc aaa gcg aaa aac caa gga ggt agt tac ggc tat tgc tac tct ttt 193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe
30 35 40

gcc tgc tgg tgc gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt 241
Ala Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu
45 50 55 60

cct aat aaa tcg tgc agc aaa aaa taatggcaac gtcttttttat tgtccaccaa 295
Pro Asn Lys Ser Cys Ser Lys Lys
65

cagaaatatt gtaacgcttc ttaattg 322

<210> 66

<211> 87

<212> PRT

<213> Centruroides limpidus limpidus

<400> 66

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Glu Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro
50 55 60

Asn Lys Ser Cys Ser Lys Lys
65

<210> 67
<211> 198
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (1)..(198)
<223> Product= Sodium-channel modifier toxin

<400> 67
aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc 48
Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

ttc tgg ttg gga aaa aac gaa aac tgc gat aag gaa tgc aaa gcg aaa 96
Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggc tat tgc tac tct ttt gcc tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt cct aat aaa tcg 192
Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

tgc agc 198
Cys Ser
65

<210> 68
<211> 66
<212> PRT
<213> Centruroides limpidus limpidus

<400> 68
Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
35 40 45

Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser

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50                               55                               60

Cys Ser
65

<210> 69
<211> 322
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium-channel modifier toxin precursor
      In the mature peptide, the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (269)..(322)
<223>

<220>
<221> 5'UTR
<222> (1)..(4)
<223>

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223>

<400> 69
gaag atg aat tgc ttg ttg atg atc act gct tgt ttg gtc cta ttc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly
              -15                      -10                      -5

aca gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
      -1  1                      5                      10

aaa tac ggt tgc ttc tgg ttg gga aaa aac gaa aac tgc gat atg gaa      145
Lys Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu
      15                      20                      25

tgc aaa gcg aaa aac caa gga ggt agt tac ggc tat tgc tac tct ttt      193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe
      30                      35                      40

gcc tgc tgg tgc gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt      241
Ala Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu
      45                      50                      55                      60

cct aat aaa tgc tgc agc aaa aaa taatggcaac gtcttttttat tgtccaccaa      295
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Pro Asn Lys Ser Cys Ser Lys Lys
65

cagaaatatt gtaacgcttc ttaattg

322

<210> 70

<211> 87

<212> PRT

<213> Centruroides limpidus limpidus

<400> 70

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Gly Cys Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro
50 55 60

Asn Lys Ser Cys Ser Lys Lys
65

<210> 71

<211> 198

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(198)

<223> Product= Sodium-channel modifier toxin

<400> 71

aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc 48
Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

ttc tgg ttg gga aaa aac gaa aac tgc gat atg gaa tgc aaa gcg aaa 96
Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggc tat tgc tac tct ttt gcc tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gat agt aca ccg act tat ccc ctt cct aat aaa tcg 192

Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60

tgc agc
 Cys Ser
 65

198

<210> 72
 <211> 66
 <212> PRT
 <213> Centruroides limpidus limpidus

<400> 72

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
 1 5 10 15

Phe Trp Leu Gly Lys Asn Glu Asn Cys Asp Met Glu Cys Lys Ala Lys
 20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys
 35 40 45

Glu Gly Leu Pro Asp Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60

Cys Ser
 65

<210> 73
 <211> 316
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (5)..(259)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Ser is amidated, and the last Gly
 and the last basic aminoacid are cut

<220>
 <221> 3'UTR
 <222> (263)..(316)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)
 <223>

<220>
 <221> mat_peptide
 <222> (62)..()
 <223> Product= Sodium-channel modifier toxin

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<220>
<221>  sig_peptide
<222>  (5)..(61)
<223>

<400>  73
gaag atg aac tcg ttg ttg atg att att ggt tgt ttg gtc ctg atc gga      49
      Met Asn Ser Leu Leu Met Ile Ile Gly Cys Leu Val Leu Ile Gly
            -15                    -10                    -5

aca gtg tgg aca aag gaa ggt tat ctg gtg aac atg aaa acg ggc tgc      97
Thr Val Trp Thr Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys
            -1  1                    5                    10

aaa tac ggg tgc tat gaa ttg ggt gac aac ggt tac tgc gat agg aaa      145
Lys Tyr Gly Cys Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys
            15                    20                    25

tgc aaa gcg gag agc ggt aac tac ggc tat tgc tat act gtt ggg tgc      193
Cys Lys Ala Glu Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys
            30                    35                    40

tgg tgc gaa gga ttg ccc aat agt aaa ccg act tgg ccc ctt cct ggt      241
Trp Cys Glu Gly Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly
45                    50                    55                    60

aaa tca tgc agc gga aaa taatagcaac gtctttttat tgtccaccaa      289
Lys Ser Cys Ser Gly Lys
            65

cagaaatatt gtaacgcttc ttaattg      316

<210>  74
<211>  85
<212>  PRT
<213>  Centruroides limpidus limpidus

<400>  74
Met Asn Ser Leu Leu Met Ile Ile Gly Cys Leu Val Leu Ile Gly Thr
            -15                    -10                    -5

Val Trp Thr Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys Lys
            -1  1                    5                    10

Tyr Gly Cys Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys
            15                    20                    25

Lys Ala Glu Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp
30                    35                    40                    45

Cys Glu Gly Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly Lys
            50                    55                    60

Ser Cys Ser Gly Lys

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65

<210> 75
<211> 192
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<400> 75
aag gaa ggt tat ctg gtg aac atg aaa acg ggc tgc aaa tac ggg tgc 48
Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

tat gaa ttg ggt gac aac ggt tac tgc gat agg aaa tgc aaa gcg gag 96
Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys Lys Ala Glu
20 25 30

agc ggt aac tac ggc tat tgc tat act gtt ggg tgc tgg tgc gaa gga 144
Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp Cys Glu Gly
35 40 45

ttg ccc aat agt aaa ccg act tgg ccc ctt cct ggt aaa tca tgc agc 192
Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly Lys Ser Cys Ser
50 55 60

<210> 76
<211> 64
<212> PRT
<213> Centruroides limpidus limpidus

<400> 76
Lys Glu Gly Tyr Leu Val Asn Met Lys Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

Tyr Glu Leu Gly Asp Asn Gly Tyr Cys Asp Arg Lys Cys Lys Ala Glu
20 25 30

Ser Gly Asn Tyr Gly Tyr Cys Tyr Thr Val Gly Cys Trp Cys Glu Gly
35 40 45

Leu Pro Asn Ser Lys Pro Thr Trp Pro Leu Pro Gly Lys Ser Cys Ser
50 55 60

<210> 77
<211> 316
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS

<222> (5)..(259)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (263)..(316)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)
 <223>

<220>
 <221> mat_peptide
 <222> (62)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide
 <222> (5)..(61)
 <223>

<400> 77
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga 49
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly
 -15 -10 -5
 aca gtg tgg gca aag gaa ggt tat ctg gtg aac acg tac acg ggc tgc 97
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys
 -1 1 5 10
 aaa tac att tgc tgg aaa ttg gga gag aac aaa tac tgc att gat gaa 145
 Lys Tyr Ile Cys Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu
 15 20 25
 tgt aaa gag ata gga gct ggt tac ggc tat tgc tac ggt ttt ggg tgc 193
 Cys Lys Glu Ile Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys
 30 35 40
 tat tgc gaa gga ttt ccc gaa aat aaa ccg acc tgg ccc ctt cct aat 241
 Tyr Cys Glu Gly Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn
 45 50 55 60
 aaa aca tgc ggc aga aaa taatgacaac gtctttttat tgtccaccaa 289
 Lys Thr Cys Gly Arg Lys
 65
 cagaaatatt gtaacgcttc ttaattg 316

<210> 78
 <211> 85
 <212> PRT
 <213> Centruroides limpidus limpidus

<400> 78

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys Lys
-1 1 5 10

Tyr Ile Cys Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu Cys
15 20 25

Lys Glu Ile Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr
30 35 40 45

Cys Glu Gly Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn Lys
50 55 60

Thr Cys Gly Arg Lys
65

<210> 79
<211> 189
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (1)..(189)
<223> Product= Sodium-channel modifier toxin

<400> 79
aag gaa ggt tat ctg gtg aac acg tac acg ggc tgc aaa tac att tgc 48
Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys Lys Tyr Ile Cys
1 5 10 15

tgg aaa ttg gga gag aac aaa tac tgc att gat gaa tgt aaa gag ata 96
Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu Cys Lys Glu Ile
20 25 30

gga gct ggt tac ggc tat tgc tac ggt ttt ggg tgc tat tgc gaa gga 144
Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu Gly
35 40 45

ttt ccc gaa aat aaa ccg acc tgg ccc ctt cct aat aaa aca tgc 189
Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn Lys Thr Cys
50 55 60

<210> 80
<211> 63
<212> PRT
<213> Centruroides limpidus limpidus

<400> 80

Lys Glu Gly Tyr Leu Val Asn Thr Tyr Thr Gly Cys Lys Tyr Ile Cys
1 5 10 15

Trp Lys Leu Gly Glu Asn Lys Tyr Cys Ile Asp Glu Cys Lys Glu Ile
20 25 30

Gly Ala Gly Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu Gly
35 40 45

Phe Pro Glu Asn Lys Pro Thr Trp Pro Leu Pro Asn Lys Thr Cys
50 55 60

<210> 81
<211> 274
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (2)..(217)
<223> Product= Sodium-channel modifier toxin precursor

In the mature peptide, the last Cys is amidated, and the last Gly and the last 2 basic aminoacids are cut

<220>
<221> sig_peptide
<222> (2)..(13)
<223> Carboxy-end of the signal peptide

<220>
<221> mat_peptide
<222> (14)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> 3'UTR
<222> (221)..(274)

<400> 81
a aca gtg tcg gca aaa gaa ggt tat ctg gtg aag aag agc aat ggt tgc 49
Thr Val Ser Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys
-1 1 5 10

aaa tac gag tgc ttt aaa ttg gga gaa aac gaa cac tgc gat acg gaa 97
Lys Tyr Glu Cys Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu
15 20 25

tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc gac act ttt 145
Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe
30 35 40

gag tgt tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tgg cct ctt 193
Glu Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu
45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatggcaac gtcttttttat tgtccaccaa 247
Pro Asn Lys Ser Cys Gly Lys Lys
65

cagaaatatt gtaacgcttc ttaattg

274

<210> 82
 <211> 72
 <212> PRT
 <213> Centruroides limpidus limpidus

<400> 82

Thr Val Ser Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys
 -1 1 5 10

Lys Tyr Glu Cys Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu
 15 20 25

Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe
 30 35 40

Glu Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu
 45 50 55 60

Pro Asn Lys Ser Cys Gly Lys Lys
 65

<210> 83
 <211> 195
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (1)..(195)
 <223> Product= Sodium-channel modifier toxin

<400> 83
 aaa gaa ggt tat ctg gtg aag aag agc aat ggt tgc aaa tac gag tgc 48
 Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys Lys Tyr Glu Cys
 1 5 10 15

ttt aaa ttg gga gaa aac gaa cac tgc gat acg gaa tgc aaa gcg ccg 96
 Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu Cys Lys Ala Pro
 20 25 30

aac caa gga ggt agt tac ggc tat tgc gac act ttt gag tgt tgg tgc 144
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe Glu Cys Trp Cys
 35 40 45

gaa ggt ttg ccc gaa agt aca ccg act tgg cct ctt cct aat aaa tca 192
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser
 50 55 60

tgc 195
 Cys
 65

<210> 84
<211> 65
<212> PRT
<213> Centruroides limpidus limpidus

<400> 84

Lys Glu Gly Tyr Leu Val Lys Lys Ser Asn Gly Cys Lys Tyr Glu Cys
1 5 10 15

Phe Lys Leu Gly Glu Asn Glu His Cys Asp Thr Glu Cys Lys Ala Pro
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Asp Thr Phe Glu Cys Trp Cys
35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Ser
50 55 60

Cys
65

<210> 85
<211> 323
<212> DNA
<213> Centruroides noxius

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Asn is amidated, and the last Gly
and the last basic aminoacid are cut

<220>
<221> 3'UTR
<222> (269)..(323)
<223>

<220>
<221> 5'UTR
<222> (1)..(4)
<223>

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223>

<400> 85

gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gcc ctg gtc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly
-15 -10 -5

aca gtg tgg tca aag gaa ggt tat ata gta aac tcg tac acg ggc tgc 97
Thr Val Trp Ser Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys
-1 1 5 10

aaa tac gaa tgc ttg aaa ttg gga gac aac gat tat tgc ttg agg gaa 145
Lys Tyr Glu Cys Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
15 20 25

tgc aaa cag cag tac gga aaa ggt gct ggc ggc tat tgt tac gct ttt 193
Cys Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe
30 35 40

ggg tgc tgg tgc aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt 241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
45 50 55 60

aaa aat aag aca tgc aac gga aaa taatggcaac gactttttat tgcccaccaa 295
Lys Asn Lys Thr Cys Asn Gly Lys
65

cagaaatatt gtaacgcttc ttaattgg 323

<210> 86
<211> 87
<212> PRT
<213> Centruroides noxius

<400> 86

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Val Gly Thr
-15 -10 -5

Val Trp Ser Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys
-1 1 5 10

Tyr Glu Cys Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys
15 20 25

Lys Gln Gln Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly
30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys
50 55 60

Asn Lys Thr Cys Asn Gly Lys
65

<210> 87
<211> 198
<212> DNA
<213> Centruroides noxius

<220>
<221> CDS
<222> (1)..(198)
<223> Product= Sodium-channel modifier toxin

<400> 87
aag gaa ggt tat ata gta aac tcg tac acg ggc tgc aaa tac gaa tgc 48
Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15
ttg aaa ttg gga gac aac gat tat tgc ttg agg gaa tgc aaa cag cag 96
Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
20 25 30
tac gga aaa ggt gct ggc ggc tat tgt tac gct ttt ggg tgc tgg tgc 144
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45
aca cat ttg tac gaa caa gcg gtg gtc tgg ccc ctt aaa aat aag aca 192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys Asn Lys Thr
50 55 60
tgc aac 198
Cys Asn
65

<210> 88
<211> 66
<212> PRT
<213> Centruroides noxius

<400> 88
Lys Glu Gly Tyr Ile Val Asn Ser Tyr Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15
Leu Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Gln Gln
20 25 30
Tyr Gly Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Lys Asn Lys Thr
50 55 60
Cys Asn
65

<210> 89
<211> 323
<212> DNA
<213> Centruroides noxius

<220>
<221> CDS

<222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Ser is amidated, and the last Gly
 and the last basic aminoacid are cut

<220>
 <221> 3'UTR
 <222> (269)..(323)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)
 <223>

<220>
 <221> mat_peptide
 <222> (62)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide
 <222> (5)..(61)
 <223>

<400> 89
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
 -15 -10 -5
 aca gtg tgc gca aag gaa ggt tat ctg gtg aac aaa agc aca ggc tgt 97
 Thr Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
 -1 1 5 10
 aaa tac aac tgc ttg ata ttg gga gaa aac aaa aac tgc gat atg gaa 145
 Lys Tyr Asn Cys Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu
 15 20 25
 tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gga ttt 193
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe
 30 35 40
 ggg tgc tat tgt gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt 241
 Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu
 45 50 55 60
 cct aat aaa aca tgc agc gga aaa taatggcaac gactttttat tgtccaccaa 295
 Pro Asn Lys Thr Cys Ser Gly Lys
 65
 cagaaatagt gtaacgcttc ttaattgc 323

<210> 90
 <211> 87
 <212> PRT
 <213> Centruroides noxius

<400> 90

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
 -15 -10 -5

Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
 -1 1 5 10

Tyr Asn Cys Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu Cys
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly
 30 35 40 45

Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro
 50 55 60

Asn Lys Thr Cys Ser Gly Lys
 65

<210> 91
 <211> 198
 <212> DNA
 <213> Centruroides noxius

<220>
 <221> CDS
 <222> (1)..(198)
 <223> Product= Sodium-channel modifier toxin

<400> 91
 aag gaa ggt tat ctg gtg aac aaa agc aca ggc tgt aaa tac aac tgc 48
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asn Cys
 1 5 10 15
 ttg ata ttg gga gaa aac aaa aac tgc gat atg gaa tgc aaa gcg aag 96
 Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu Cys Lys Ala Lys
 20 25 30
 aac caa gga ggt agt tac ggc tat tgc tac gga ttt ggg tgc tat tgt 144
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys
 35 40 45
 gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt cct aat aaa aca 192
 Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Thr
 50 55 60
 tgc agc 198
 Cys Ser
 65

<210> 92
 <211> 66
 <212> PRT
 <213> Centruroides noxius

<400> 92

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asn Cys
1 5 10 15

Leu Ile Leu Gly Glu Asn Lys Asn Cys Asp Met Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys
35 40 45

Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro Asn Lys Thr
50 55 60

Cys Ser
65

<210> 93

<211> 323

<212> DNA

<213> Centruroides elegans

<220>

<221> CDS

<222> (5)..(265)

<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Asn is amidated, and the last Gly
and the last basic aminoacid are cut

<220>

<221> 3'UTR

<222> (269)..(323)

<223>

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<220>

<221> mat_peptide

<222> (68)..()

<223> Product= Sodium-channel modifier toxin

<220>

<221> sig_peptide

<222> (5)..(67)

<223>

<400> 93

gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gcc ctg atc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Ala Leu Ile Gly
-20 -15 -10

aca gtg tgg gca aag gaa ggt tat att gta aac tac cac gat ggc tgc 97

Thr	Val	Trp	Ala	Lys	Glu	Gly	Tyr	Ile	Val	Asn	Tyr	His	Asp	Gly	Cys		
-5					-1	1				5					10		
aaa	tac	gaa	tgc	tat	aaa	ttg	gga	gat	aac	gat	tat	tgc	cta	agg	gaa		145
Lys	Tyr	Glu	Cys	Tyr	Lys	Leu	Gly	Asp	Asn	Asp	Tyr	Cys	Leu	Arg	Glu		
				15					20					25			
tgc	aaa	ttg	aga	tac	gga	aaa	ggg	gct	ggc	ggc	tat	tgc	tac	gct	ttt		193
Cys	Lys	Leu	Arg	Tyr	Gly	Lys	Gly	Ala	Gly	Gly	Tyr	Cys	Tyr	Ala	Phe		
				30				35					40				
ggg	tgc	tgg	tgc	aca	cat	ttg	tac	gaa	caa	gcg	gtg	gtc	tgg	ccc	ctt		241
Gly	Cys	Trp	Cys	Thr	His	Leu	Tyr	Glu	Gln	Ala	Val	Val	Trp	Pro	Leu		
				45			50					55					
cct	aaa	aaa	aga	tgc	aat	gga	aaa	taatggcaac	gactttttat	tgtccaccaa							295
Pro	Lys	Lys	Arg	Cys	Asn	Gly	Lys										
	60					65											
cagaaatatt	gtaacgcttc	ttaattgc															323

<210> 94
 <211> 87
 <212> PRT
 <213> Centruroides elegans

<400> 94

Met	Asn	Ser	Leu	Leu	Met	Ile	Thr	Ala	Cys	Leu	Ala	Leu	Ile	Gly	Thr		
-20						-15					-10						
Val	Trp	Ala	Lys	Glu	Gly	Tyr	Ile	Val	Asn	Tyr	His	Asp	Gly	Cys	Lys		
-5				-1	1				5					10			
Tyr	Glu	Cys	Tyr	Lys	Leu	Gly	Asp	Asn	Asp	Tyr	Cys	Leu	Arg	Glu	Cys		
				15				20					25				
Lys	Leu	Arg	Tyr	Gly	Lys	Gly	Ala	Gly	Gly	Tyr	Cys	Tyr	Ala	Phe	Gly		
				30			35					40					
Cys	Trp	Cys	Thr	His	Leu	Tyr	Glu	Gln	Ala	Val	Val	Trp	Pro	Leu	Pro		
	45					50					55						
Lys	Lys	Arg	Cys	Asn	Gly	Lys											
60					65												

<210> 95
 <211> 192
 <212> DNA
 <213> Centruroides elegans

<220>
 <221> CDS
 <222> (1)..(192)
 <223> Product= Sodium-channel modifier toxin

<400> 95
 ggt tat att gta aac tac cac gat ggc tgc aaa tac gaa tgc tat aaa 48
 Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys Tyr Lys
 1 5 10 15

ttg gga gat aac gat tat tgc cta agg gaa tgc aaa ttg aga tac gga 96
 Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg Tyr Gly
 20 25 30

aaa ggt gct ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc aca cat 144
 Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Thr His
 35 40 45

ttg tac gaa caa gcg gtg gtc tgg ccc ctt cct aaa aaa aga tgc aat 192
 Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg Cys Asn
 50 55 60

<210> 96
 <211> 64
 <212> PRT
 <213> Centruroides elegans

<400> 96

Gly Tyr Ile Val Asn Tyr His Asp Gly Cys Lys Tyr Glu Cys Tyr Lys
 1 5 10 15

Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg Tyr Gly
 20 25 30

Lys Gly Ala Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Thr His
 35 40 45

Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Arg Cys Asn
 50 55 60

<210> 97
 <211> 323
 <212> DNA
 <213> Centruroides elegans

<220>
 <221> CDS
 <222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last 2 basic aminoacids are cut

<220>
 <221> 3'UTR
 <222> (269)..(323)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)

<223>

<220>

<221> mat_peptide

<222> (68)..()

<223> Product= Sodium-channel modifier toxin

<220>

<221> sig_peptide

<222> (5)..(67)

<223>

<400> 97

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly
-20 -15 -10

aca gtg aaa gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97
Thr Val Lys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-5 -1 1 5 10

aaa tac ggt tgc ctc ttg tta aga aaa aac gaa ggc tgc gat aag gaa 145
Lys Tyr Gly Cys Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac tct ttt 193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
45 50 55

cct aat aaa tca tgc agc aaa aaa taatggcaac gatttttttat tgtccaccaa 295
Pro Asn Lys Ser Cys Ser Lys Lys
60 65

cagaaatatt gtaacgcttc ttaatttc 323

<210> 98

<211> 87

<212> PRT

<213> Centruroides elegans

<400> 98

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
-20 -15 -10

Val Lys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-5 -1 1 5 10

Tyr Gly Cys Leu Leu Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala
30 35 40

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
45 50 55

Asn Lys Ser Cys Ser Lys Lys
60 65

<210> 99
<211> 192
<212> DNA
<213> *Centruroides elegans*

<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<400> 99
ggt tat ctg gta aac aag agc acg ggc tgc aaa tac ggt tgc ctc ttg 48
Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys Leu Leu
1 5 10 15
tta aga aaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag aac caa 96
Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys Asn Gln
20 25 30
gga ggt agt tac ggc tat tgc tac tct ttt gca tgc tgg tgc gaa ggt 144
Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys Glu Gly
35 40 45
ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca tgc agc 192
Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser Cys Ser
50 55 60

<210> 100
<211> 64
<212> PRT
<213> *Centruroides elegans*

<400> 100
Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys Leu Leu
1 5 10 15
Leu Arg Lys Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys Asn Gln
20 25 30
Gly Gly Ser Tyr Gly Tyr Cys Tyr Ser Phe Ala Cys Trp Cys Glu Gly
35 40 45
Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser Cys Ser
50 55 60

<210> 101

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<211> 323
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium-channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (269)..(323)
<223>

<220>
<221> 5'UTR
<222> (1)..(4)
<223>

<220>
<221> mat_peptide
<222> (65)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(64)
<223>

<400> 101
gaag atg aat tgc ttg ttg atg atc act gct tgc ttg gtc ctg atc gga      49
  Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
    -20                      -15                      -10

aca gtg tgt gca aag gaa ggt tat ctg gta aac aag agc acg ggc tgc      97
Thr Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-5                      -1 1                      5                      10

aaa tac agt tgc gtg tta ttg gga aaa aac gaa aac tgc gat aag gaa      145
Lys Tyr Ser Cys Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu
    15                      20                      25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gct ttt      193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
    30                      35                      40

ggg tgc tgg tgt gaa gga ttg ccc gaa agt aca ccg act tat ccc att      241
Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
    45                      50                      55

cct ggt aaa tca tgc ggc aga aaa taacggcaac gatattttat tgtttaccaa      295
Pro Gly Lys Ser Cys Gly Arg Lys
    60                      65

cagaaatatt gtaacgcttc ttaatttc      323

<210> 102

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<211> 87
 <212> PRT
 <213> *Centruroides elegans*

<400> 102

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
 -20 -15 -10 -5

Val Cys Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
 -1 1 5 10

Tyr Ser Cys Val Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly
 30 35 40

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro
 45 50 55 60

Gly Lys Ser Cys Gly Arg Lys
 65

<210> 103
 <211> 192
 <212> DNA
 <213> *Centruroides elegans*

<220>
 <221> CDS
 <222> (1)..(192)
 <223> Product= Sodium-channel modifier toxin

<400> 103

gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac agt tgc gtg 48
 Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys Val
 1 5 10 15

tta ttg gga aaa aac gaa aac tgc gat aag gaa tgc aaa gcg aag aac 96
 Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys Asn
 20 25 30

caa gga ggt agt tac ggc tat tgc tac gct ttt ggg tgc tgg tgt gaa 144
 Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
 35 40 45

gga ttg ccc gaa agt aca ccg act tat ccc att cct ggt aaa tca tgc 192
 Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
 50 55 60

<210> 104
 <211> 64
 <212> PRT

<213> Centruroides elegans

<400> 104

Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys Val
1 5 10 15

Leu Leu Gly Lys Asn Glu Asn Cys Asp Lys Glu Cys Lys Ala Lys Asn
20 25 30

Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
35 40 45

Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
50 55 60

<210> 105

<211> 323

<212> DNA

<213> Centruroides elegans

<220>

<221> CDS

<222> (5)..(265)

<223> Product= Sodium-channel modifier toxin precursor

In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>

<221> 3'UTR

<222> (269)..(323)

<223>

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<220>

<221> mat_peptide

<222> (65)..()

<223> Product= Sodium-channel modifier toxin Ce6b

<220>

<221> sig_peptide

<222> (5)..(64)

<223>

<400> 105

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
-20 -15 -10

aca gtt tgc gca aag gat ggt tat ctg gta aac aag agc acg ggc tgc 97
Thr Val Cys Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-5 -1 1 5 10

aaa tac agt tgc ggg aaa ttg gga gaa aac gaa cac tgc gat aag gaa 145
Lys Tyr Ser Cys Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tat gct ttt 193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
30 35 40

ggg tgc tgg tgt gaa gga ttg ccc gaa agt acc ccg act tat ccc att 241
Gly Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile
45 50 55

cct ggt aaa tca tgc ggc aga aaa taacggcaac gatattttat tgtttaccaa 295
Pro Gly Lys Ser Cys Gly Arg Lys
60 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 106
<211> 87
<212> PRT
<213> Centruroides elegans

<400> 106

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
-20 -15 -10 -5

Val Cys Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Ser Cys Gly Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly
30 35 40

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro
45 50 55 60

Gly Lys Ser Cys Gly Arg Lys
65

<210> 107
<211> 192
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<400> 107

gat ggt tat ctg gta aac aag agc acg ggc tgc aaa tac agt tgc ggg 48
 Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys Gly
 1 5 10 15

aaa ttg gga gaa aac gaa cac tgc gat aag gaa tgc aaa gcg aag aac 96
 Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys Lys Ala Lys Asn
 20 25 30

caa gga ggt agt tac ggc tat tgc tat gct ttt ggg tgc tgg tgt gaa 144
 Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
 35 40 45

gga ttg ccc gaa agt acc ccg act tat ccc att cct ggt aaa tca tgc 192
 Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
 50 55 60

<210> 108

<211> 64

<212> PRT

<213> Centruroides elegans

<400> 108

Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys Gly
 1 5 10 15

Lys Leu Gly Glu Asn Glu His Cys Asp Lys Glu Cys Lys Ala Lys Asn
 20 25 30

Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys Glu
 35 40 45

Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Ile Pro Gly Lys Ser Cys
 50 55 60

<210> 109

<211> 311

<212> DNA

<213> Centruroides elegans

<220>

<221> CDS

<222> (5)..(256)

<223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>

<221> 3'UTR

<222> (260)..(311)

<223>

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<220>
 <221> mat_peptide
 <222> (59)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide
 <222> (5)..(58)
 <223>

<400> 109
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga 49
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly
 -15 -10 -5

aat gtg tgg gca aag gac ggt tat ctg gtg aac aag acg ggc tgc aaa 97
 Asn Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys
 -1 1 5 10

tac aat tgc tgg ata ttg gga gaa aac aaa tac tgc aat tcg gaa tgc 145
 Tyr Asn Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys
 15 20 25

aaa gag gta ggt gct ggt tac ggc tat tgc tat gct ttt ggg tgc tat 193
 Lys Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr
 30 35 40 45

tgc gaa gga tta ccc gaa agc gta ctg acc tgg ccc ctt tct gat aaa 241
 Cys Glu Gly Leu Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys
 50 55 60

aca tgc ggc aga aaa taatggcaac gtcttttttat tgtccaccaa cagaaatatt 296
 Thr Cys Gly Arg Lys
 65

gtaacgcttc ttaat 311

<210> 110
 <211> 84
 <212> PRT
 <213> Centruroides elegans

<400> 110
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Asn
 -15 -10 -5

Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys Tyr
 -1 1 5 10

Asn Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys Lys
 15 20 25 30

Glu Val Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr Cys
 35 40 45

Glu Gly Leu Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys Thr
50 55 60

Cys Gly Arg Lys
65

<210> 111
<211> 189
<212> DNA
<213> *Centruroides elegans*

<220>
<221> CDS
<222> (1)..(189)
<223> Product= Sodium-channel modifier toxin

<400> 111
gca aag gac ggt tat ctg gtg aac aag acg ggc tgc aaa tac aat tgc 48
Ala Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys Tyr Asn Cys
1 5 10 15
tgg ata ttg gga gaa aac aaa tac tgc aat tcg gaa tgc aaa gag gta 96
Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys Lys Glu Val
20 25 30
ggt gct ggt tac ggc tat tgc tat gct ttt ggg tgc tat tgc gaa gga 144
Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr Cys Glu Gly
35 40 45
tta ccc gaa agc gta ctg acc tgg ccc ctt tct gat aaa aca tgc 189
Leu Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys Thr Cys
50 55 60

<210> 112
<211> 63
<212> PRT
<213> *Centruroides elegans*

<400> 112
Ala Lys Asp Gly Tyr Leu Val Asn Lys Thr Gly Cys Lys Tyr Asn Cys
1 5 10 15
Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Ser Glu Cys Lys Glu Val
20 25 30
Gly Ala Gly Tyr Gly Tyr Cys Tyr Ala Phe Gly Cys Tyr Cys Glu Gly
35 40 45
Leu Pro Glu Ser Val Leu Thr Trp Pro Leu Ser Asp Lys Thr Cys
50 55 60

<210> 113
<211> 323

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<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium-channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
<222> (269)..(323)
<223>

<220>
<221> 5'UTR
<222> (1)..(4)
<223>

<220>
<221> mat_peptide
<222> (65)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(64)
<223>

<400> 113
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc atg ttc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly
      -20                      -15                      -10

aca gtg tgg gca aaa aaa gac ggt tat ctg gtg gac aag acg ggc tgc      97
Thr Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys
-5                      -1 1                      5                      10

aaa tac act tgc tgg ata ttg gga gaa aac aaa tac tgc aat agg gaa      145
Lys Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu
                      15                      20                      25

tgc aca tgg aag cac cga gga ggt aat tac ggc tat tgc tac gga ttt      193
Cys Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe
                      30                      35                      40

ggg tgc tat tgc gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt      241
Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu
                      45                      50                      55

tct aat aaa aga tgc ggc aaa aaa taatggcaac gacttttttat tgtccaccaa      295
Ser Asn Lys Arg Cys Gly Lys Lys
60                      65

cagaaatatt gtaacgcttc ttaattgc      323

<210> 114
<211> 87

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<212> PRT
<213> Centruroides elegans

<400> 114

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly Thr
-20 -15 -10 -5

Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys
-1 1 5 10

Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys
15 20 25

Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly
30 35 40

Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser
45 50 55 60

Asn Lys Arg Cys Gly Lys Lys
65

<210> 115
<211> 192
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<400> 115
aaa gac ggt tat ctg gtg gac aag acg ggc tgc aaa tac act tgc tgg 48
Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp
1 5 10 15
ata ttg gga gaa aac aaa tac tgc aat agg gaa tgc aca tgg aag cac 96
Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His
20 25 30
cga gga ggt aat tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa 144
Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
35 40 45
gga ttg tcc gat agt aca ccg act tgg ccc ctt tct aat aaa aga tgc 192
Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser Asn Lys Arg Cys
50 55 60

<210> 116
<211> 64
<212> PRT
<213> Centruroides elegans

<400> 116

Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys Tyr Thr Cys Trp
1 5 10 15

Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys Thr Trp Lys His
20 25 30

Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
35 40 45

Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Ser Asn Lys Arg Cys
50 55 60

<210> 117

<211> 323

<212> DNA

<213> *Centruroides elegans*

<220>

<221> CDS

<222> (5)..(265)

<223> Product= Sodium-channel modifier toxin precursor

In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>

<221> 3'UTR

<222> (269)..(323)

<223>

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<220>

<221> mat_peptide

<222> (65)..()

<223> Product= Sodium-channel modifier toxin

<220>

<221> sig_peptide

<222> (5)..(64)

<223>

<400> 117

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc atg ttc gga 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly
-20 -15 -10

aca gtg tgg gca aaa aaa gac ggt tat ctg gtg gac aag acg ggc tgc 97
Thr Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys
-5 -1 1 5 10

aaa tac act tgc tgg ata ttg gga gaa aac aaa tac tgc aat agg gaa 145


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Lys Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu
      15                      20                      25

tgc aca tgg aag cac cga gga ggt aat tac ggc tat tgc tac gga ttt      193
Cys Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe
      30                      35                      40

ggg tgc tat tgc gaa gga ttg tcc gat agt aca ccg act tgg ccc ctt      241
Gly Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu
      45                      50                      55

cct aat aaa aga tgc ggc aaa aaa taatggcaac gacttttttat tgtccaccaa      295
Pro Asn Lys Arg Cys Gly Lys Lys
60                      65

cagaaatagt gtaacgcttc ttaattgc      323

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<210> 118
<211> 87
<212> PRT
<213> Centruroides elegans

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<400> 118

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Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Met Phe Gly Thr
-20                      -15                      -10                      -5

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Val Trp Ala Lys Lys Asp Gly Tyr Leu Val Asp Lys Thr Gly Cys Lys
      -1  1                      5                      10

```

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Tyr Thr Cys Trp Ile Leu Gly Glu Asn Lys Tyr Cys Asn Arg Glu Cys
      15                      20                      25

```

```

Thr Trp Lys His Arg Gly Gly Asn Tyr Gly Tyr Cys Tyr Gly Phe Gly
      30                      35                      40

```

```

Cys Tyr Cys Glu Gly Leu Ser Asp Ser Thr Pro Thr Trp Pro Leu Pro
45                      50                      55                      60

```

```

Asn Lys Arg Cys Gly Lys Lys
      65

```

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<210> 119
<211> 192
<212> DNA
<213> Centruroides elegans

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<220>
<221> CDS
<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

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<400> 119
aaa gac ggt tat ctg gtg gac aag acg ggc tgc aaa tac act tgc tgg      48

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Lys	Asp	Gly	Tyr	Leu	Val	Asp	Lys	Thr	Gly	Cys	Lys	Tyr	Thr	Cys	Trp		
1				5					10					15			
ata	ttg	gga	gaa	aac	aaa	tac	tgc	aat	agg	gaa	tgc	aca	tgg	aag	cac		96
Ile	Leu	Gly	Glu	Asn	Lys	Tyr	Cys	Asn	Arg	Glu	Cys	Thr	Trp	Lys	His		
			20				25						30				
cga	gga	ggt	aat	tac	ggc	tat	tgc	tac	gga	ttt	ggg	tgc	tat	tgc	gaa		144
Arg	Gly	Gly	Asn	Tyr	Gly	Tyr	Cys	Tyr	Gly	Phe	Gly	Cys	Tyr	Cys	Glu		
			35				40					45					
gga	ttg	tcc	gat	agt	aca	ccg	act	tgg	ccc	ctt	cct	aat	aaa	aga	tgc		192
Gly	Leu	Ser	Asp	Ser	Thr	Pro	Thr	Trp	Pro	Leu	Pro	Asn	Lys	Arg	Cys		
	50					55					60						

<210> 120
 <211> 64
 <212> PRT
 <213> Centruroides elegans

<400> 120

Lys	Asp	Gly	Tyr	Leu	Val	Asp	Lys	Thr	Gly	Cys	Lys	Tyr	Thr	Cys	Trp		
1				5					10					15			
Ile	Leu	Gly	Glu	Asn	Lys	Tyr	Cys	Asn	Arg	Glu	Cys	Thr	Trp	Lys	His		
			20				25						30				
Arg	Gly	Gly	Asn	Tyr	Gly	Tyr	Cys	Tyr	Gly	Phe	Gly	Cys	Tyr	Cys	Glu		
			35				40					45					
Gly	Leu	Ser	Asp	Ser	Thr	Pro	Thr	Trp	Pro	Leu	Pro	Asn	Lys	Arg	Cys		
	50					55					60						

<210> 121
 <211> 323
 <212> DNA
 <213> Centruroides gracilis

<220>
 <221> CDS
 <222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
 <221> 5'UTR
 <222> (1)..(4)
 <223>

<220>
 <221> 3'UTR
 <222> (269)..(323)
 <223>

<220>
 <221> mat_peptide
 <222> (71)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide
 <222> (5)..(70)
 <223>

<400> 121
 gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
 -20 -15 -10

acc gtg tgg gca aag gac ggt tat ctg gtg aag aag agc gac ggc tgc 97
 Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
 -5 -1 1 5

aaa tac ggt tgc atg ctc aag ata gga gac gct ggc tgt gat aag gaa 145
 Lys Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu
 10 15 20 25

tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc tac ctt ctt 193
 Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu
 30 35 40

ggg tgc tgg tgc gaa ggt atg cct gaa agt aca ccg act tat ccc ctt 241
 Gly Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu
 45 50 55

cct ggt aaa tca tgc ggc aaa aaa taatggcaac gtcttttttat tgtccactaa 295
 Pro Gly Lys Ser Cys Gly Lys Lys
 60 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 122
 <211> 87
 <212> PRT
 <213> Centruroides gracilis

<400> 122
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
 -20 -15 -10

Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys
 -5 -1 1 5 10

Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys
 15 20 25

Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly
 30 35 40

Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
45 50 55

Gly Lys Ser Cys Gly Lys Lys
60 65

<210> 123
<211> 186
<212> DNA
<213> *Centruroides gracilis*

<220>
<221> CDS
<222> (1)..(186)
<223> Product= Sodium-channel modifier toxin

<400> 123
tat ctg gtg aag aag agc gac ggc tgc aaa tac ggt tgc atg ctc aag 48
Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys
1 5 10 15

ata gga gac gct ggc tgt gat aag gaa tgc aaa gcg ccg aac caa gga 96
Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly
20 25 30

ggt agt tac ggc tat tgc tac ctt ctt ggg tgc tgg tgc gaa ggt atg 144
Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met
35 40 45

cct gaa agt aca ccg act tat ccc ctt cct ggt aaa tca tgc 186
Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys
50 55 60

<210> 124
<211> 62
<212> PRT
<213> *Centruroides gracilis*

<400> 124

Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys
1 5 10 15

Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly
20 25 30

Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met
35 40 45

Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys
50 55 60

<210> 125
<211> 323

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<212> DNA
<213> Centruroides gracilis

<220>
<221> CDS
<222> (5)..(265)
<223> Product= Sodium-channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
<221> 5'UTR
<222> (1)..(4)
<223>

<220>
<221> 3'UTR
<222> (269)..(323)
<223>

<220>
<221> sig_peptide
<222> (5)..(70)
<223>

<220>
<221> mat_peptide
<222> (71)..()
<223> Product= Sodium-channel modifier toxin

<400> 125
gaag atg aac tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga      49
      Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
              -20                      -15                      -10

acc gtg tgg gca aag gac ggt tat ctg gtg aag gag agc gac ggc tgc      97
Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys
              -5                      -1  1                      5

aaa tac ggt tgc atg ctc aag ata gga gac gct ggc tgt gat aag gaa      145
Lys Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu
10                      15                      20                      25

tgc aaa gcg ccg aac caa gga ggt agt tac ggc tat tgc tac ctt ctt      193
Cys Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu
              30                      35                      40

ggg tgc tgg tgc gaa ggt atg cct gaa agt aca ccg act tat ccc ctt      241
Gly Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu
              45                      50                      55

cct ggt aaa tca tgc ggc aaa aaa taatggcaac gtcttttttat tgtccactaa      295
Pro Gly Lys Ser Cys Gly Lys Lys
60                      65

cagaaatatt gtaacgcttc ttaattgc      323

<210> 126
<211> 87

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<212> PRT
<213> Centruroides gracilis

<400> 126

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
-20 -15 -10

Val Trp Ala Lys Asp Gly Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys
-5 -1 1 5 10

Tyr Gly Cys Met Leu Lys Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys
15 20 25

Lys Ala Pro Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly
30 35 40

Cys Trp Cys Glu Gly Met Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
45 50 55

Gly Lys Ser Cys Gly Lys Lys
60 65

<210> 127
<211> 186
<212> DNA
<213> Centruroides gracilis

<220>
<221> CDS
<222> (1)..(186)
<223> Product= Sodium-channel modifier toxin

<400> 127
tat ctg gtg aag gag agc gac ggc tgc aaa tac ggt tgc atg ctc aag 48
Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys
1 5 10 15

ata gga gac gct ggc tgt gat aag gaa tgc aaa gcg ccg aac caa gga 96
Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly
20 25 30

ggt agt tac ggc tat tgc tac ctt ctt ggg tgc tgg tgc gaa ggt atg 144
Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met
35 40 45

cct gaa agt aca ccg act tat ccc ctt cct ggt aaa tca tgc 186
Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys
50 55 60

<210> 128
<211> 62
<212> PRT
<213> Centruroides gracilis

<400> 128

Tyr Leu Val Lys Glu Ser Asp Gly Cys Lys Tyr Gly Cys Met Leu Lys
1 5 10 15

Ile Gly Asp Ala Gly Cys Asp Lys Glu Cys Lys Ala Pro Asn Gln Gly
20 25 30

Gly Ser Tyr Gly Tyr Cys Tyr Leu Leu Gly Cys Trp Cys Glu Gly Met
35 40 45

Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Gly Lys Ser Cys
50 55 60

<210> 129

<211> 323

<212> DNA

<213> Centruroides gracilis

<220>

<221> CDS

<222> (5)..(265)

<223> Product= Sodium-channel modifier toxin precursor

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<220>

<221> 3'UTR

<222> (269)..(323)

<223>

<220>

<221> mat_peptide

<222> (62)..()

<223> Product= Sodium-channel modifier toxin

<220>

<221> sig_peptide

<222> (5)..(61)

<223>

<400> 129

gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc ctg atc gga 49
Met Asn Ser Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
-15 -10 -5

acg gtg tgg gca aag gac ggt tat ctg gtg aac aag agc acg ggc tgc 97
Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-1 1 5 10

aaa tac agt tgc ata gaa aat ata aac gac agt cac tgc aat gag gaa 145
Lys Tyr Ser Cys Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu
15 20 25

tgt ata tcg tcg atc cgc aaa ggt agt tac ggc tat tgc tac aaa ttt 193
Cys Ile Ser Ser Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe
30 35 40

tac tgt tat tgc ata ggt atg ccc gat agt aca cag gtt tat cct att 241
Tyr Cys Tyr Cys Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile
45 50 55 60

cct ggt aaa act tgc agc aca gaa taatggcaac gtcttttttat tgtccaccaa 295
Pro Gly Lys Thr Cys Ser Thr Glu
65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 130
<211> 87
<212> PRT
<213> *Centruroides gracilis*

<400> 130

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Ser Cys Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys
15 20 25

Ile Ser Ser Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr
30 35 40 45

Cys Tyr Cys Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro
50 55 60

Gly Lys Thr Cys Ser Thr Glu
65

<210> 131
<211> 204
<212> DNA
<213> *Centruroides gracilis*

<220>
<221> CDS
<222> (1)..(204)
<223> Product= Sodium-channel modifier toxin

<400> 131
aag gac ggt tat ctg gtg aac aag agc acg ggc tgc aaa tac agt tgc 48
Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys
1 5 10 15

ata gaa aat ata aac gac agt cac tgc aat gag gaa tgt ata tcg tcg	96
Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys Ile Ser Ser	
20 25 30	

atc cgc aaa ggt agt tac ggc tat tgc tac aaa ttt tac tgt tat tgc	144
Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr Cys Tyr Cys	
35 40 45	

ata ggt atg ccc gat agt aca cag gtt tat cct att cct ggt aaa act	192
Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro Gly Lys Thr	
50 55 60	

tgc agc aca gaa	204
Cys Ser Thr Glu	
65	

<210> 132
 <211> 68
 <212> PRT
 <213> Centruroides gracilis

<400> 132

Lys Asp Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Ser Cys
1 5 10 15

Ile Glu Asn Ile Asn Asp Ser His Cys Asn Glu Glu Cys Ile Ser Ser
20 25 30

Ile Arg Lys Gly Ser Tyr Gly Tyr Cys Tyr Lys Phe Tyr Cys Tyr Cys
35 40 45

Ile Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Ile Pro Gly Lys Thr
50 55 60

Cys Ser Thr Glu
65

<210> 133
 <211> 323
 <212> DNA
 <213> Centruroides gracilis

<220>
 <221> CDS
 <222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Cys is amidated, and the last Gly
 and the last 2 basic aminoacids are cut

<220>
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 <222> (1)..(4)
 <223>

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<220>
<221> 3'UTR
<222> (269) .. (323)
<223>
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<222> (71)..()
<223> Product= Sodium-channel modifier toxin
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<222>   (5)..(70)
<223>
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[illegible]

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<210> 134
<211> 87
<212> PRT
<213> Centruroides gracilis
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<400>      134
Met  Asn  Ser  Leu  Leu  Met  Ile  Thr  Ala  Cys  Leu  Val  Leu  Ile  Gly  Thr
          -20                      -15                      -10

Val  Trp  Thr  Lys  Asp  Gly  Tyr  Leu  Val  Lys  Lys  Ser  Asp  Gly  Cys  Lys
          -5          -1   1          5          10

Tyr  Gly  Cys  Val  Met  Leu  Val  Gly  Asp  Ser  Gly  Cys  Asp  Thr  Glu  Cys
          15          20          25

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Lys Ala Lys Asn Gln Gly Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly
30 35 40

Cys Trp Cys Thr Gly Met Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro
45 50 55

Asp Lys Ser Cys Gly Lys Lys
60 65

<210> 135
<211> 186
<212> DNA
<213> Centruroides gracilis

<220>
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<400> 135
tat ctg gtg aag aag agc gac ggc tgc aaa tac ggt tgc gta atg ttg 48
Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Val Met Leu
1 5 10 15
gtc gga gac agt ggc tgc gat acg gaa tgc aaa gcg aag aat caa ggt 96
Val Gly Asp Ser Gly Cys Asp Thr Glu Cys Lys Ala Lys Asn Gln Gly
20 25 30
ggt aaa aaa gga tgg tgc tac gcc ttt ggg tgc tgg tgc aca ggt atg 144
Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly Cys Trp Cys Thr Gly Met
35 40 45
ccc gac agt aca cag gtt tat ccc ctt cct gat aaa tca tgc 186
Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro Asp Lys Ser Cys
50 55 60

<210> 136
<211> 62
<212> PRT
<213> Centruroides gracilis

<400> 136

Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Gly Cys Val Met Leu
1 5 10 15

Val Gly Asp Ser Gly Cys Asp Thr Glu Cys Lys Ala Lys Asn Gln Gly
20 25 30

Gly Lys Lys Gly Trp Cys Tyr Ala Phe Gly Cys Trp Cys Thr Gly Met
35 40 45

Pro Asp Ser Thr Gln Val Tyr Pro Leu Pro Asp Lys Ser Cys
50 55 60

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<210> 137
<211> 323
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
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<223> Product= Sodium-channel modifier toxin precursor
      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

<220>
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<222> (269)..(323)
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<222> (1)..(4)
<223>

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<220>
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<222> (5)..(61)
<223>

<300>
<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
      that recognize Na+-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(265)

<400> 137
gaag atg aat tcg ttg ttg atc atc act gtt tgt ttg ttc ctg atc gga      49
      Met Asn Ser Leu Leu Ile Ile Thr Val Cys Leu Phe Leu Ile Gly
              -15                      -10                      -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
              -1  1                      5                      10

aaa tac gat tgc ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa      145
Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu
              15                      20                      25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc      193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe

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30	35	40	
gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt			241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu			
45	50	55	60
cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa			295
Pro Asn Lys Ser Cys Gly Lys Lys			
	65		
cagaaatatt gtaacgcttc ttaattgc			323

<210> 138
 <211> 87
 <212> PRT
 <213> Centruroides sculpturatus

<400> 138

Met Asn Ser Leu Leu Ile Ile Thr Val Cys Leu Phe Leu Ile Gly Thr		
	-15	-10
		-5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys		
	-1 1	5
		10

Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys		
	15	20
		25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala		
	30	35
		40
		45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro		
	50	55
		60

Asn Lys Ser Cys Gly Lys Lys	
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<210> 139
 <211> 195
 <212> DNA
 <213> Centruroides sculpturatus

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 <222> (1)..(195)
 <223> Product= Sodium-channel modifier toxin

<300>
 <301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
 <302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
 that recognize Na+-channelS
 <303> Toxicon
 <304> 39
 <305> 12

<306> 1893-1898
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<400> 139
 aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa tac gat tgc 48
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asp Cys
 1 5 10 15
 ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa tgc aaa gcg aag 96
 Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys Lys Ala Lys
 20 25 30
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45
 gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60
 tgc 195
 Cys
 65

<210> 140
 <211> 65
 <212> PRT
 <213> Centruroides sculpturatus

<400> 140
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Asp Cys
 1 5 10 15
 Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys Lys Ala Lys
 20 25 30
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60
 Cys
 65

<210> 141
 <211> 323
 <212> DNA
 <213> Centruroides sculpturatus

<220>
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 <222> (5) .. (265)

<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium-channel modifier toxin

<220>
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<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion *Centruroides sculpturatus* Ewing,
that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
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<400> 141
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Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly
-15 -10 -5

aca gtg tgg gca aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
-1 1 5 10

aaa tac gat tgc ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa 145
Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193
Cys Lys Ala Lys Asn Gln Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295
Pro Asn Lys Ser Cys Gly Lys Lys
65

cagaaatagt gtaacgcttc ttaattgc

323

<210> 142
 <211> 87
 <212> PRT
 <213> Centruroides sculpturatus

<400> 142

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly Thr
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys
 -1 1 5 10

Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
 50 55 60

Asn Lys Ser Cys Gly Lys Lys
 65

<210> 143
 <211> 195
 <212> DNA
 <213> Centruroides sculpturatus

<220>
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 <222> (1)..(195)
 <223> Product= Sodium-channel modifier toxin

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 <301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
 <302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
 <305> 12
 <306> 1893-1898
 <307> 2001-12-01
 <309>
 <313> (1)..(195)

<400> 143
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 Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys
 1 5 10 15

48

ttt tgg ttg gga aaa aac gaa cac tgc gat ttg gaa tgc aaa gcg aag 96
Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

tgc 195
Cys
65

<210> 144
<211> 65
<212> PRT
<213> Centruroides sculpturatus

<400> 144

Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys Tyr Asp Cys
1 5 10 15

Phe Trp Leu Gly Lys Asn Glu His Cys Asp Leu Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

Cys
65

<210> 145
<211> 323
<212> DNA
<213> Centruroides sculpturatus

<220>
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<222> (5)..(265)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
<221> 3'UTR
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<220>
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 <223> Product= Sodium-channel modifier toxin

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 <302> Genes and peptides from the scorpion *Centruroides sculpturatus* Ewing,
 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
 <305> 12
 <306> 1893-1898
 <307> 2001-12-01
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<400> 145
 gaag atg aac tcg ttg ttg atg atc act gct tgt ttg ttc ctg atc gga 49
 Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly
 -15 -10 -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
 -1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145
 Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
 15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
 30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
 45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295
 Pro Asn Lys Ser Cys Gly Lys Lys
 65

cagaaatatt gtaacgcttc ttaattgc 323

<210> 146
 <211> 87
 <212> PRT
 <213> *Centruroides sculpturatus*

<400> 146

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
50 55 60

Asn Lys Ser Cys Gly Lys Lys
65

<210> 147
<211> 195
<212> DNA
<213> Centruroides sculpturatus

<220>
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<223> Product= Sodium-channel modifier toxin

<300>
<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (1)..(195)

<400> 147
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Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96
Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser

50 55 60 195
tgc
Cys
65

<210> 148
<211> 65
<212> PRT
<213> Centruroides sculpturatus

<400> 148

Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
1 5 10 15

Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

Cys
65

<210> 149
<211> 320
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (5)..(262)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223>

<220>
<221> 3'UTR
<222> (266)..(320)
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<220>
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<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na+-channels
<303> Toxicon
<304> 39
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<306> 1893-1898
<307> 2001-12-01
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<400> 149
gaag atg aat tgc ttg ttg atg att act gct tgt ttg gtc ctg atc gga      49
  Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly
        -15                      -10                      -5

aca gtg tgg gca aag gac ggt tat cta gtg gaa aag acg ggc tgc aaa      97
Thr Val Trp Ala Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys
        -1  1                      5                      10

aag act tgc tac aaa ttg gga gaa aac gat ttt tgc aat agg gaa tgc      145
Lys Thr Cys Tyr Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys
        15                      20                      25

aaa tgg aag cac ata gga ggt agt tat ggc tat ttc tac gga ttt ggg      193
Lys Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly
        30                      35                      40

tgc tat tgc gaa gga ttg ccc gat agt aca cag act tgg ccc ctt cct      241
Cys Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro
        45                      50                      55                      60

aat aaa aca tgc ggc aaa aaa taatggcaac gactttttat tgttcaccaa      292
Asn Lys Thr Cys Gly Lys Lys
        65

aagaaatagt gtaacgcttc ttaatttc      320

<210> 150
<211> 86
<212> PRT
<213> Centruroides sculpturatus

<400> 150
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Ile Gly Thr
        -15                      -10                      -5

Val Trp Ala Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys Lys
        -1  1                      5                      10

Thr Cys Tyr Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys Lys
        15                      20                      25

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Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly Cys
30 35 40 45

Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn
50 55 60

Lys Thr Cys Gly Lys Lys
65

<210> 151
<211> 192
<212> DNA
<213> Centruroides sculpturatus

<220>
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<222> (1)..(192)
<223> Product= Sodium-channel modifier toxin

<300>
<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (1)..(192)

<400> 151
aag gac ggt tat cta gtg gaa aag acg ggc tgc aaa aag act tgc tac 48
Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys Lys Thr Cys Tyr
1 5 10 15

aaa ttg gga gaa aac gat ttt tgc aat agg gaa tgc aaa tgg aag cac 96
Lys Leu Gly Glu Asn Asp Phe Cys Asn Arg Glu Cys Lys Trp Lys His
20 25 30

ata gga ggt agt tat ggc tat ttc tac gga ttt ggg tgc tat tgc gaa 144
Ile Gly Gly Ser Tyr Gly Tyr Phe Tyr Gly Phe Gly Cys Tyr Cys Glu
35 40 45

gga ttg ccc gat agt aca cag act tgg ccc ctt cct aat aaa aca tgc 192
Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys
50 55 60

<210> 152
<211> 64
<212> PRT
<213> Centruroides sculpturatus

<400> 152

Lys Asp Gly Tyr Leu Val Glu Lys Thr Gly Cys Lys Lys Thr Cys Tyr

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Lys	Leu	Gly	Glu
	20	Asn	Asp
Phe	Cys	Asn	Arg
	25	Glu	Cys
Lys	Trp	Lys	His
	30		
Ile	Gly	Gly	Ser
	35	Tyr	Gly
Tyr	Phe	Tyr	Gly
	40	Phe	Gly
Cys	Tyr	Cys	Glu
	45		
Gly	Leu	Pro	Asp
	50	Ser	Thr
Gln	Thr	Trp	Pro
	55	Leu	Pro
Asn	Lys	Thr	Cys
	60		

<210> 153
 <211> 319
 <212> DNA
 <213> Centruroides sculpturatus

<220>
 <221> CDS
 <222> (1)..(261)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last 2 basic aminoacids are cut

<220>
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<220>
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 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
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atg aat tcg ttg ttg atc atc act gct tgt ttg ttc ctg atc gga acc		48
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	-15 -10 -5	

gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc aaa		96
Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys		
	-1 1 5 10	

tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc 144
Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys
15 20 25

aaa gcg gag aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca 192
Lys Ala Glu Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
30 35 40 45

tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt ccc 240
Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
50 55 60

aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 291
Asn Lys Ser Cys Ser Arg Lys
65

cagaaatatt gtaacgcttc ttaattgc 319

<210> 154
<211> 87
<212> PRT
<213> Centruroides sculpturatus

<400> 154

Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
-1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys
15 20 25

Lys Ala Glu Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
50 55 60

Asn Lys Ser Cys Ser Arg Lys
65

<210> 155
<211> 198
<212> DNA
<213> Centruroides sculpturatus

<220>
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<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
 <302> Genes and peptides from the scorpion *Centruroides sculpturatus* Ewing,
 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
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 1 5 10 15
 ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg gag 96
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Glu
 20 25 30
 aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45
 gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt ccc aat aaa tca 192
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60
 tgc agc 198
 Cys Ser
 65

<210> 156
 <211> 66
 <212> PRT
 <213> *Centruroides sculpturatus*

<400> 156
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
 1 5 10 15
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Glu
 20 25 30
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60
 Cys Ser
 65

<210> 157
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<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last 2 basic aminoacids are cut

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that recognize Na⁺-channels
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-15 -10 -5

acc gtg tgg gca aga gaa ggt tat ctg gta aac aag agc acg ggc tgc 97
Thr Val Trp Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145
Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt 241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu

45 50 55 60
 cct aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 295
 Pro Asn Lys Ser Cys Ser Arg Lys
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cagaaatagt gtaacgcttc ttaatttc 323

<210> 158
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 <213> Centruroides sculpturatus

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Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr
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Val Trp Ala Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys
 -1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
 50 55 60

Asn Lys Ser Cys Ser Arg Lys
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Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
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ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag      96
Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
      20      25      30

aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc      144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
      35      40      45

gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt cct aat aaa tca      192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
      50      55      60

tgc agc      198
Cys Ser
65

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<210> 160
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<213> Centruroides sculpturatus

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<400> 160
Arg Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
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Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
      20      25      30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
      35      40      45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
      50      55      60

Cys Ser
65

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<210> 161
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      In the mature peptide, the last 2 basic aminoacids are cut

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-15 -10 -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg gcc tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys
-1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145
Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt 241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
45 50 55 60

cct aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 295
Pro Asn Lys Ser Cys Ser Arg Lys
65

cagaaatatt gtaacgcttc ttaattga 323

<210> 162
<211> 87

<212> PRT
<213> Centruroides sculpturatus

<400> 162

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys Lys
 -1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys
 15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
 30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
 50 55 60

Asn Lys Ser Cys Ser Arg Lys
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<400> 163
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Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys Lys Tyr Gly Cys
1 5 10 15

ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96
Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
 20 25 30

aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144

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Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
      35              40              45

gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt cct aat aaa tca      192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
      50              55              60

tgc agc      198
Cys Ser
65

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<210> 164
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<213> Centruroides sculpturatus

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<400> 164

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Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Ala Cys Lys Tyr Gly Cys
1              5              10              15

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Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
      20              25              30

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Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
      35              40              45

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Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
      50              55              60

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Cys Ser
65

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<210> 165
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      In the mature peptide, the last Cys is amidated, and the last Gly
      and the last 2 basic aminoacids are cut

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aca gtg tgg gca aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc 97
 Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
 -1 1 5 10

aaa tac gat tgc ttt tgg ttg gga aaa aac gaa cac tgc gat acg gaa 145
 Lys Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu
 15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193
 Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
 30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241
 Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
 45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295
 Pro Asn Lys Ser Cys Gly Lys Lys
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cggaatatgt gtaacgcttc ttaattgc 323

<210> 166
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 <213> *Centruroides sculpturatus*

<400> 166
 Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Phe Ala Leu Val Gly Thr
 -15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys
-1 1 5 10

Tyr Asp Cys Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala
30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro
50 55 60

Asn Lys Ser Cys Gly Lys Lys
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1 5 10 15

ttt tgg ttg gga aaa aac gaa cac tgc gat acg gaa tgc aaa gcg aag 96
Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu Cys Lys Ala Lys
20 25 30

aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc 144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca 192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

tgc 195
Cys

65

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<213> Centruroides sculpturatus

<400> 168

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1 5 10 15

Phe Trp Leu Gly Lys Asn Glu His Cys Asp Thr Glu Cys Lys Ala Lys
20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

Cys
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<210> 169
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In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

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-15 -10 -5

aca gtg tgg gca aag gaa ggt tat ctg gtg aag aag agc gat ggc tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys
-1 1 5 10

aaa tac gat tgc ttt tgg ttg gga gaa aac gaa ggc tgc gat aag gaa 145
Lys Tyr Asp Cys Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggg tat tgc tac gct ttc 193
Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt 241
Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
45 50 55 60

cct aat aaa tca tgc ggc aaa aaa taatagcaac aacttttttat tgtccaccaa 295
Pro Asn Lys Ser Cys Gly Lys Lys
65

cagaaatagt gtaacgcttc ttaattgc 323

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<213> *Centruroides sculpturatus*

<400> 170

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Phe Ala Leu Val Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Lys Lys Ser Asp Gly Cys Lys
-1 1 5 10

Tyr Asp Cys Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys
15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala

30		35		40		45									
Cys	Trp	Cys	Glu	Gly	Leu	Pro	Glu	Ser	Thr	Pro	Thr	Tyr	Pro	Leu	Pro
			50						55					60	

Asn	Lys	Ser	Cys	Gly	Lys	Lys
			65			

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ttt tgg ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag	96
Phe Trp Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys	
20 25 30	
aac caa gga ggt agt tac ggg tat tgc tac gct ttc gca tgc tgg tgc	144
Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys	
35 40 45	
gaa ggt ttg ccc gaa agt aca ccg act tat ccc ctt cct aat aaa tca	192
Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser	
50 55 60	
tgc	195
Cys	
65	

<210> 172
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 <213> Centruroides sculpturatus

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20 25 30

Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
50 55 60

Cys
65

<210> 173
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In the mature peptide, the last 2 basic aminoacids are cut

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-15 -10 -5

acc gtg tgg gca aaa gaa ggt tat ctg gta aac aag agc acg ggc tgc 97

Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys
-1 1 5 10

aaa tac ggt tgc ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa 145

Lys Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu
15 20 25

tgc aaa gcg aag aac caa gga ggt agt tac ggc tat tgc tac gct ttc 193

Cys Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe
30 35 40

gca tgc tgg tgc gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt 241

Ala Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu
45 50 55 60

cct aat aaa tca tgc agc aga aaa taatggcaac gactttttat tgtccaccaa 295

Pro Asn Lys Ser Cys Ser Arg Lys
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cagaaatagt gtaacgcttc ttaattgc 323

<210> 174

<211> 87

<212> PRT

<213> Centruroides sculpturatus

<400> 174

Met Asn Ser Leu Leu Ile Ile Thr Ala Cys Leu Phe Leu Ile Gly Thr

-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys

-1 1 5 10

Tyr Gly Cys Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys

15 20 25

Lys Ala Lys Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala

30 35 40 45

Cys Trp Cys Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro

50 55 60

Asn Lys Ser Cys Ser Arg Lys

65

<210> 175
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 <213> Centruroides sculpturatus

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 ctg aaa ttg gga gaa aac gaa ggc tgc gat aag gaa tgc aaa gcg aag 96
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
 20 25 30
 aac caa gga ggt agt tac ggc tat tgc tac gct ttc gca tgc tgg tgc 144
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45
 gaa ggt ttg ccc gaa agt aca ccg act tat cct ctt cct aat aaa tca 192
 Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60
 tgc agc 198
 Cys Ser
 65

<210> 176
 <211> 66
 <212> PRT
 <213> Centruroides sculpturatus

<400> 176
 Lys Glu Gly Tyr Leu Val Asn Lys Ser Thr Gly Cys Lys Tyr Gly Cys
 1 5 10 15
 Leu Lys Leu Gly Glu Asn Glu Gly Cys Asp Lys Glu Cys Lys Ala Lys
 20 25 30
 Asn Gln Gly Gly Ser Tyr Gly Tyr Cys Tyr Ala Phe Ala Cys Trp Cys
 35 40 45

Glu Gly Leu Pro Glu Ser Thr Pro Thr Tyr Pro Leu Pro Asn Lys Ser
 50 55 60

Cys Ser
 65

<210> 177
 <211> 313
 <212> DNA
 <213> Centruroides sculpturatus

<220>
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 <222> (5)..(256)
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> 3'UTR
 <222> (260)..(313)
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<220>
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 <222> (62)..()
 <223> Product= Sodium-channel modifier toxin

<220>
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 <222> (5)..(61)
 <223>

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 <301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
 <302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
 <305> 12
 <306> 1893-1898
 <307> 2001-12-01
 <309>
 <313> (5)..(256)

<400> 177
 gaag atg aat tcg ttg ttg atg att act act tgt ttg att ctg atc gga 49
 Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Ile Gly
 -15 -10 -5

act gtg ttg gca gag gat ggt tat ttg ttt gac aag aga aag cgc tgc 97
 Thr Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys
 -1 1 5 10

aca ctc gaa tgc ata gac aag aca gga gac aaa aat tgc gat agg aat 145
 Thr Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn
 15 20 25

tgc aag aat gaa gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc 193
 Cys Lys Asn Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys
 30 35 40

tgg tgc aaa gga ttg ccc gga att aca ccg att tca cgt act cct ggt 241
 Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly
 45 50 55 60

aaa aca tgt aaa ata taatggcaac tttttttatt gtgcaccaac agaaatagt 296
 Lys Thr Cys Lys Ile
 65

taacgcttct taattgc 313

<210> 178
 <211> 84
 <212> PRT
 <213> Centruroides sculpturatus

<400> 178

Met Asn Ser Leu Leu Met Ile Thr Thr Cys Leu Ile Leu Ile Gly Thr
 -15 -10 -5

Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr
 -1 1 5 10

Leu Glu Cys Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys
 15 20 25

Lys Asn Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp
 30 35 40 45

Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys
 50 55 60

Thr Cys Lys Ile
 65

<210> 179
 <211> 195
 <212> DNA
 <213> Centruroides sculpturatus

<220>
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 <222> (1)..(195)
 <223> Product= Sodium-channel modifier toxin

<300>

<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
 <302> Genes and peptides from the scorpion *Centruroides sculpturatus* Ewing,
 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
 <305> 12
 <306> 1893-1898
 <307> 2001-12-01
 <309>
 <313> (1)..(195)

<400> 179
 gag gat ggt tat ttg ttt gac aag aga aag cgc tgc aca ctc gaa tgc 48
 Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys
 1 5 10 15
 ata gac aag aca gga gac aaa aat tgc gat agg aat tgc aag aat gaa 96
 Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Asn Glu
 20 25 30
 gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc tgg tgc aaa gga 144
 Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
 35 40 45
 ttg ccc gga att aca ccg att tca cgt act cct ggt aaa aca tgt aaa 192
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys
 50 55 60
 ata 195
 Ile
 65

<210> 180
 <211> 65
 <212> PRT
 <213> *Centruroides sculpturatus*

<400> 180
 Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys
 1 5 10 15
 Ile Asp Lys Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Asn Glu
 20 25 30
 Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
 35 40 45
 Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys
 50 55 60
 Ile
 65

<210> 181
 <211> 313

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<212> DNA
<213> Centruroides sculpturatus

<220>
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<222> (5)..(256)
<223> Product= Sodium-channel modifier toxin precursor

<220>
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<222> (1)..(4)
<223>

<220>
<221> mat_peptide
<222> (62)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (5)..(61)
<223>

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<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na+-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(256)

<400> 181
gaag atg aat tcg ttg ttg atc att act act tgt ttg att ctg atc gga      49
    Met Asn Ser Leu Leu Ile Ile Thr Thr Cys Leu Ile Leu Ile Gly
          -15                      -10                      -5

act gtg ttg gca gag gat ggt tat ttg ttt gac aag aga aag cgc tgc      97
Thr Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys
      -1  1                      5                      10

aca ctc gaa tgc ata gac atg aca gga gac aaa aat tgc gat agg aat      145
Thr Leu Glu Cys Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn
      15                      20                      25

tgc aag aag gaa gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc      193
Cys Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys
      30                      35                      40

tgg tgc aaa gga ttg ccc gga att aca ccg att tca cgt act cct ggt      241
Trp Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly
      45                      50                      55                      60

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aaa aca tgt aaa ata taatggcaac tttttttatt gtgcaccaac agaaatattg 296
Lys Thr Cys Lys Ile
65

taacgcttct taatttc 313

<210> 182
<211> 84
<212> PRT
<213> Centruroides sculpturatus

<400> 182

Met Asn Ser Leu Leu Ile Ile Thr Thr Cys Leu Ile Leu Ile Gly Thr
-15 -10 -5

Val Leu Ala Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr
-1 1 5 10

Leu Glu Cys Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys
15 20 25

Lys Lys Glu Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp
30 35 40 45

Cys Lys Gly Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys
50 55 60

Thr Cys Lys Ile
65

<210> 183
<211> 195
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (1)..(195)
<223> Product= Sodium-channel modifier toxin

<300>
<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (1)..(195)
<400> 183

gag gat ggt tat ttg ttt gac aag aga aag cgc tgc aca ctc gaa tgc 48
Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys
1 5 10 15

ata gac atg aca gga gac aaa aat tgc gat agg aat tgc aag aag gaa 96
Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu
20 25 30

gga ggt agt ttt ggc aaa tgc tcc tat ttt gca tgc tgg tgc aaa gga 144
Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
35 40 45

ttg ccc gga att aca ccg att tca cgt act cct ggt aaa aca tgt aaa 192
Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys
50 55 60

ata 195
Ile
65

<210> 184
<211> 65
<212> PRT
<213> Centruroides sculpturatus

<400> 184

Glu Asp Gly Tyr Leu Phe Asp Lys Arg Lys Arg Cys Thr Leu Glu Cys
1 5 10 15

Ile Asp Met Thr Gly Asp Lys Asn Cys Asp Arg Asn Cys Lys Lys Glu
20 25 30

Gly Gly Ser Phe Gly Lys Cys Ser Tyr Phe Ala Cys Trp Cys Lys Gly
35 40 45

Leu Pro Gly Ile Thr Pro Ile Ser Arg Thr Pro Gly Lys Thr Cys Lys
50 55 60

Ile
65

<210> 185
<211> 314
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (2)..(256)
<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

<220>

<221> 5'UTR
<222> (260)..(314)
<223>

<220>
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<222> (1)..(1)
<223>

<220>
<221> mat_peptide
<222> (59)..()
<223> Product= Sodium-channel modifier toxin

<220>
<221> sig_peptide
<222> (2)..(58)
<223>

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<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion *Centruroides sculpturatus* Ewing,
that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(256)

<400> 185
g atg aac tcg ttg ttg atg atc act gct tgt ttg gtc cta ttc gga aca 49
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
-15 -10 -5

gtc tgg tca gag aaa ggt tat ctg gtg cat gag gac acg ggc tgc aga 97
Val Trp Ser Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg
-1 1 5 10

tac aag tgc act ttt tcg gga gaa aat agt tac tgc gat aag gaa tgc 145
Tyr Lys Cys Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys
15 20 25

aag agc caa gga ggt gat tct ggc att tgc caa tct aag gcg tgt tat 193
Lys Ser Gln Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr
30 35 40 45

tgc caa ggt ttg ccc gaa gat aca aag act tgg ccc ctt att ggt aaa 241
Cys Gln Gly Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys
50 55 60

tta tgc ggc aga aaa taatggcttc gtctttttat tgttcaccaa caaaaatagt 296
Leu Cys Gly Arg Lys
65

gtaacgcttc ttaatttc 314

<210> 186
<211> 85

<212> PRT
<213> Centruroides sculpturatus

<400> 186

Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Leu Phe Gly Thr
 -15 -10 -5

Val Trp Ser Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg
 -1 1 5 10

Tyr Lys Cys Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys
 15 20 25

Lys Ser Gln Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr
30 35 40 45

Cys Gln Gly Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys
 50 55 60

Leu Cys Gly Arg Lys
 65

<210> 187
<211> 189
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (1)..(189)
<223> Product= Sodium-channel modifier toxin

<300>
<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus
Ewing, that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (1)..(189)

<400> 187
gag aaa ggt tat ctg gtg cat gag gac acg ggc tgc aga tac aag tgc 48
Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg Tyr Lys Cys
1 5 10 15

act ttt tcg gga gaa aat agt tac tgc gat aag gaa tgc aag agc caa 96
Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys Lys Ser Gln
 20 25 30

gga ggt gat tct ggc att tgc caa tct aag gcg tgt tat tgc caa ggt 144

Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr Cys Gln Gly
 35 40 45

ttg ccc gaa gat aca aag act tgg ccc ctt att ggt aaa tta tgc 189
 Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys Leu Cys
 50 55 60

<210> 188
 <211> 63
 <212> PRT
 <213> Centruroides sculpturatus

<400> 188

Glu Lys Gly Tyr Leu Val His Glu Asp Thr Gly Cys Arg Tyr Lys Cys
 1 5 10 15

Thr Phe Ser Gly Glu Asn Ser Tyr Cys Asp Lys Glu Cys Lys Ser Gln
 20 25 30

Gly Gly Asp Ser Gly Ile Cys Gln Ser Lys Ala Cys Tyr Cys Gln Gly
 35 40 45

Leu Pro Glu Asp Thr Lys Thr Trp Pro Leu Ile Gly Lys Leu Cys
 50 55 60

<210> 189
 <211> 321
 <212> DNA
 <213> Centruroides sculpturatus

<220>
 <221> CDS
 <222> (5)..(265)
 <223> Product= Sodium-channel modifier toxin precursor
 In the mature peptide, the last Asn is amidated, and the last Gly
 and the last basic aminoacid are cut

<220>
 <221> 3'UTR
 <222> (269)..(321)
 <223>

<220>
 <221> 5'UTR
 <222> (1)..(4)
 <223>

<220>
 <221> mat_peptide
 <222> (62)..()
 <223> Product= Sodium-channel modifier toxin

<220>
 <221> sig_peptide

<222> (5)..(61)

<223>

<300>

<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.

<302> Genes and peptides from the scorpion *Centruroides sculpturatus* Ewing, that recognize Na⁺-channels

<303> Toxicon

<304> 39

<305> 12

<306> 1893-1898

<307> 2001-12-01

<309>

<313> (5)..(265)

<400> 189

gaag atg aac tcg ttg ttg atc atc gct gct tgt ttg gcc ctg atc gga 49
Met Asn Ser Leu Leu Ile Ile Ala Ala Cys Leu Ala Leu Ile Gly
-15 -10 -5

aca gtc tgg gca aag gaa ggt tat att gtg aac tat cac acg ggc tgc 97
Thr Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys
-1 1 5 10

aaa tac gaa tgc ttt aaa ttg gga gac aac gat tat tgc ctg agg gaa 145
Lys Tyr Glu Cys Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu
15 20 25

tgc aaa ttg aga cac gga aaa ggt agt ggc ggc tat tgc tac gct ttt 193
Cys Lys Leu Arg His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe
30 35 40

ggg tgc tgg tgc aca cac ttg tac gaa caa gca gtg gtt tgg ccc ctt 241
Gly Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu
45 50 55 60

cct aag aaa aaa tgc aac gga aaa taatggcaac gacttttttat tgtccaccaa 295
Pro Lys Lys Lys Cys Asn Gly Lys
65

cagaaatagt gtaacgcttc ttaatt 321

<210> 190

<211> 87

<212> PRT

<213> *Centruroides sculpturatus*

<400> 190

Met Asn Ser Leu Leu Ile Ile Ala Ala Cys Leu Ala Leu Ile Gly Thr
-15 -10 -5

Val Trp Ala Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys
-1 1 5 10

Tyr Glu Cys Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys
15 20 25

Lys Leu Arg His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly
30 35 40 45

Cys Trp Cys Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro
50 55 60

Lys Lys Lys Cys Asn Gly Lys
65

<210> 191
<211> 198
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (1)..(198)
<223> Product= Sodium-channel modifier toxin

<300>
<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na⁺-channels
<303> Toxicon
<304> 39
<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (1)..(198)

<400> 191
aag gaa ggt tat att gtg aac tat cac acg ggc tgc aaa tac gaa tgc 48
Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15
ttt aaa ttg gga gac aac gat tat tgc ctg agg gaa tgc aaa ttg aga 96
Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg
20 25 30
cac gga aaa ggt agt ggc ggc tat tgc tac gct ttt ggg tgc tgg tgc 144
His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45
aca cac ttg tac gaa caa gca gtg gtt tgg ccc ctt cct aag aaa aaa 192
Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Lys
50 55 60
tgc aac 198
Cys Asn
65

<210> 192
<211> 66
<212> PRT
<213> Centruroides sculpturatus

<400> 192

Lys Glu Gly Tyr Ile Val Asn Tyr His Thr Gly Cys Lys Tyr Glu Cys
1 5 10 15

Phe Lys Leu Gly Asp Asn Asp Tyr Cys Leu Arg Glu Cys Lys Leu Arg
20 25 30

His Gly Lys Gly Ser Gly Gly Tyr Cys Tyr Ala Phe Gly Cys Trp Cys
35 40 45

Thr His Leu Tyr Glu Gln Ala Val Val Trp Pro Leu Pro Lys Lys Lys
50 55 60

Cys Asn
65

<210> 193

<211> 320

<212> DNA

<213> Centruroides sculpturatus

<220>

<221> CDS

<222> (5)..(262)

<223> Product= Sodium-channel modifier toxin precursor
In the mature peptide, the last Cys is amidated, and the last Gly
and the last 2 basic aminoacids are cut

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<221> 5'clip

<222> (266)..(320)

<223>

<220>

<221> 5'UTR

<222> (1)..(4)

<223>

<220>

<221> mat_peptide

<222> (62)..()

<223> Product= Sodium-channel modifier toxin

<220>

<221> sig_peptide

<222> (5)..(61)

<223>

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<301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.

<302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
that recognize Na⁺-channels

<303> Toxicon

<304> 39

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<305> 12
<306> 1893-1898
<307> 2001-12-01
<309>
<313> (5)..(262)

<400> 193
gaag atg aat tcg ttg ttg atg atc act gct tgt ttg gtc gtg atc gga      49
    Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Val Ile Gly
          -15                      -10                      -5

aca gtg tgg gca aag gaa ggt tat ctg gtg gac gta aag ggc tgc aaa      97
Thr Val Trp Ala Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys
          -1  1                      5                      10

aaa aat tgc tgg aaa ttg gga gat aac gat tat tgc aat agg gaa tgt      145
Lys Asn Cys Trp Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys
          15                      20                      25

aaa tgg aag cac ata gga ggt agt tac ggc tat tgc tac gga ttt ggg      193
Lys Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly
          30                      35                      40

tgc tat tgc gaa gga ttg ccc gat agt aca cag act tgg ccc ctt cct      241
Cys Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro
          45                      50                      55                      60

aat aaa aca tgc ggc aaa aaa taatggcaac gactttttat tgtctaccaa      292
Asn Lys Thr Cys Gly Lys Lys
          65

cagaaatagt gtaacgcttc ttaattgc      320

<210> 194
<211> 86
<212> PRT
<213> Centruroides sculpturatus

<400> 194
Met Asn Ser Leu Leu Met Ile Thr Ala Cys Leu Val Val Ile Gly Thr
          -15                      -10                      -5

Val Trp Ala Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys Lys
          -1  1                      5                      10

Asn Cys Trp Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys
          15                      20                      25

Trp Lys His Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys
          30                      35                      40                      45

Tyr Cys Glu Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn
          50                      55                      60

Lys Thr Cys Gly Lys Lys

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65

<210> 195
 <211> 192
 <212> DNA
 <213> Centruroides sculpturatus

<220>
 <221> CDS
 <222> (1)..(192)
 <223> Product= Sodium-channel modifier toxin

<300>
 <301> Corona, M., Valdez-Cruz, N.A., Merino, E., Zurita, M. & Possani L.D.
 <302> Genes and peptides from the scorpion Centruroides sculpturatus Ewing,
 that recognize Na⁺-channels
 <303> Toxicon
 <304> 39
 <305> 12
 <306> 1893-1898
 <307> 2001-12-01
 <309>
 <313> (1)..(192)

<400> 195
 aag gaa ggt tat ctg gtg gac gta aag ggc tgc aaa aaa aat tgc tgg 48
 Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys Lys Asn Cys Trp
 1 5 10 15
 aaa ttg gga gat aac gat tat tgc aat agg gaa tgt aaa tgg aag cac 96
 Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys Trp Lys His
 20 25 30
 ata gga ggt agt tac ggc tat tgc tac gga ttt ggg tgc tat tgc gaa 144
 Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
 35 40 45
 gga ttg ccc gat agt aca cag act tgg ccc ctt cct aat aaa aca tgc 192
 Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys
 50 55 60

<210> 196
 <211> 64
 <212> PRT
 <213> Centruroides sculpturatus

<400> 196
 Lys Glu Gly Tyr Leu Val Asp Val Lys Gly Cys Lys Lys Asn Cys Trp
 1 5 10 15
 Lys Leu Gly Asp Asn Asp Tyr Cys Asn Arg Glu Cys Lys Trp Lys His
 20 25 30
 Ile Gly Gly Ser Tyr Gly Tyr Cys Tyr Gly Phe Gly Cys Tyr Cys Glu
 35 40 45

Gly Leu Pro Asp Ser Thr Gln Thr Trp Pro Leu Pro Asn Lys Thr Cys
50 55 60

<210> 197
<211> 190
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (130)..(190)
<223>

<400> 197
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15
tac caa gag tgt cag gat tgt tgt aag aaa gct gga cac agt gga gga 96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly
20 25 30
acc tgt atg ttt ttc aag tgt aaa tgt gcg taa actcgaaaat cagttaataa 149
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40
tatcaaagtt gtaagctatt tatgaagtga aaaataaaga t 190

<210> 198
<211> 42
<212> PRT
<213> Centruroides exilicauda

<400> 198
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly
20 25 30
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 199
<211> 126
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS

<222> (1)..(126)
<223> Product= Erg-channel modifier toxin

<400> 199
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac caa gag tgt cag gat tgt tgt aag aaa gct gga cac agt gga gga 96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly
20 25 30

acc tgt atg ttt ttc aag tgt aaa tgt gcg 126
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 200
<211> 42
<212> PRT
<213> Centruroides exilicauda

<400> 200
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Ser Gly Gly
20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 201
<211> 197
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(132)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (133)..(197)
<223>

<400> 201
gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

atc tgc gag tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142
Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

gaattaagaa tatcaaagct ggaagctgtt taaaaagtga aaaataaaga ttatt 197

<210> 202
<211> 43
<212> PRT
<213> Centruroides exilicauda

<400> 202

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 203
<211> 129
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin

<400> 203
gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

atc tgc gag tat tac aag tgt aaa tgt aac cca 129
Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 204
<211> 43
<212> PRT
<213> Centruroides exilicauda

<400> 204

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Ile Cys Glu Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 205
 <211> 196
 <212> DNA
 <213> Centruroides exilicauda
 <220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (133)..(196)
 <223>

<400> 205
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gca aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
 1 5 10 15
 tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
 Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30
 acc tgc gag tat ttc aag tgt aaa tgt aac cca taa actcgaatgt 142
 Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
 35 40
 gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttat 196

<210> 206
 <211> 43
 <212> PRT
 <213> Centruroides exilicauda

<400> 206
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
 1 5 10 15

Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
 35 40

<210> 207
 <211> 129
 <212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(129)

<223> Product= Erg-channel modifier toxin

<400> 207

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	aaa	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tac	tat	caa	tgt	gat	gaa	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	Tyr	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

acc	tgc	gag	tat	ttc	aag	tgt	aaa	tgt	aac	cca	129
Thr	Cys	Glu	Tyr	Phe	Lys	Cys	Lys	Cys	Asn	Pro	
		35					40				

<210> 208

<211> 43

<212> PRT

<213> Centruroides exilicauda

<400> 208

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	Tyr	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly
			20					25					30		

Thr	Cys	Glu	Tyr	Phe	Lys	Cys	Lys	Cys	Asn	Pro
		35					40			

<210> 209

<211> 196

<212> DNA

<213> Centruroides exilicauda

<220>

<221> CDS

<222> (1)..(132)

<223> Product= Erg-channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (133)..(196)

<223>

<400> 209

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	caa	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Gln	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

-127-

tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

acc tgc gag tat ttc aag tgt aaa tgt aac cca taa actcgaatgt 142
Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
35 40

gaattaagaa tatcaaagct ggaagctggt taagaagtga aaaataaaga ttag 196

<210> 210
<211> 43
<212> PRT
<213> Centruroides exilicauda

<400> 210

Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
35 40

<210> 211
<211> 129
<212> DNA
<213> Centruroides exilicauda

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin

<400> 211
gat aga gat agc tgt gtt gat aaa tca caa tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac tat caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

acc tgc gag tat ttc aag tgt aaa tgt aac cca 129
Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
35 40

<210> 212
<211> 43
<212> PRT
<213> Centruroides exilicauda

<400> 212

Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Tyr Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Thr Cys Glu Tyr Phe Lys Cys Lys Cys Asn Pro
35 40

<210> 213
<211> 202
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (130)..(202)
<223>

<400> 213
gat aga gat agc tgt gtt gat aaa tca cga tgc tca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr
1 5 10 15

tac caa gag tgt cag gat tgt tgc aag aaa gct gga cac aat gga gga 96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
20 25 30

acc tgc atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat gaattaacaa 149
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

tatcaaagct gtaatctatt tatgaagtaa aaaataaagt ttttgaaatt tcc 202

<210> 214
<211> 42
<212> PRT
<213> Centruroides limpidus limpidus

<400> 214

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 215
 <211> 126
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (1)..(126)
 <223> Product= Erg-channel modifier toxin

<400> 215
 gat aga gat agc tgt gtt gat aaa tca cga tgc tca aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr
 1 5 10 15
 tac caa gag tgt cag gat tgt tgc aag aaa gct gga cac aat gga gga 96
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
 20 25 30
 acc tgc atg ttt ttc aag tgt aaa tgt gcg 126
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
 35 40

<210> 216
 <211> 42
 <212> PRT
 <213> Centruroides limpidus limpidus

<400> 216
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ser Lys Tyr Gly Tyr
 1 5 10 15
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
 20 25 30
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
 35 40

<210> 217
 <211> 207
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (133)..(207)
 <223>

<400> 217
 gat aga gat agc tgt gtt gat aaa tca aaa tgt tca aaa tat gga tac 48

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Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1          5          10          15
tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

aac tgc gtg tat ttc aag tgt aaa tgt aac cca taa actcgaatgt      142
Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

gaattaagaa tatcaaagct ggaagctatt taagaagtga aaaataaaga ttattaaatt      202

tccgc      207

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<210> 218
<211> 43
<212> PRT
<213> Centruroides limpidus limpidus

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<400> 218

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Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1          5          10          15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

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<210> 219
<211> 129
<212> DNA
<213> Centruroides limpidus limpidus

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin

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<400> 219
gat aga gat agc tgt gtt gat aaa tca aaa tgt tca aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1          5          10          15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
          20          25          30

aac tgc gtg tat ttc aag tgt aaa tgt aac cca      129
Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro
          35          40

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<210> 220
<211> 43

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<212> PRT

<213> Centruroides limpidus limpidus

<400> 220

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Pro
35 40

<210> 221

<211> 209

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(132)

<223> Product= Erg-channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (133)..(209)

<223> Product= Erg-channel modifier toxin

<400> 221

gat agg gat agc tgc gtt gac aaa tca aaa tgt tca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1 5 10 15

tat ggt caa tgt gat aag tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

aac tgc gtg tat ttc aag tgt aaa tgt aac caa taa actcgaatgt 142
Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
35 40

gaacttaaga atatcaaagc tggaagctta tttaagaagt gaaaaataaa gattattaaa 202

taagaga 209

<210> 222

<211> 43

<212> PRT

<213> Centruroides limpidus limpidus

<400> 222

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
 35 40

<210> 223
 <211> 129
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (1)..(129)
 <223> Product= Erg-channel modifier toxin

<400> 223
 gat agg gat agc tgc gtt gac aaa tca aaa tgt tca aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
 1 5 10 15

tat ggt caa tgt gat aag tgt tgc aag aaa gct gga gac cgt gca gga 96
 Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

aac tgc gtg tat ttc aag tgt aaa tgt aac caa 129
 Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
 35 40

<210> 224
 <211> 43
 <212> PRT
 <213> Centruroides limpidus limpidus

<400> 224
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ser Lys Tyr Gly Tyr
 1 5 10 15

Tyr Gly Gln Cys Asp Lys Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Asn Cys Val Tyr Phe Lys Cys Lys Cys Asn Gln
 35 40

<210> 225
 <211> 141
 <212> DNA
 <213> Centruroides limpidus limpidus
 <220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (1)..(132)

<223>

<400> 225

gat	agg	gat	agc	tgc	gtt	gac	aaa	tca	aaa	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tat	ggg	caa	tgt	gat	gag	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

aac	tgc	gtg	tat	tta	aag	tgt	aaa	tgt	aac	caa	taa	actcgaatg	141
Asn	Cys	Val	Tyr	Leu	Lys	Cys	Lys	Cys	Asn	Gln			
		35					40						

<210> 226

<211> 43

<212> PRT

<213> Centruroides limpidus limpidus

<400> 226

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly
			20					25					30		

Asn	Cys	Val	Tyr	Leu	Lys	Cys	Lys	Cys	Asn	Gln
		35					40			

<210> 227

<211> 129

<212> DNA

<213> Centruroides limpidus limpidus

<220>

<221> CDS

<222> (1)..(129)

<223> Product= Erg-channel modifier toxin

<400> 227

gat	agg	gat	agc	tgc	gtt	gac	aaa	tca	aaa	tgc	gca	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Lys	Cys	Ala	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tat	ggg	caa	tgt	gat	gag	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	Gly	Gln	Cys	Asp	Glu	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

aac	tgc	gtg	tat	tta	aag	tgt	aaa	tgt	aac	caa	129
Asn	Cys	Val	Tyr	Leu	Lys	Cys	Lys	Cys	Asn	Gln	
		35					40				

<210> 228
 <211> 43
 <212> PRT
 <213> Centruroides limpidus limpidus

<400> 228

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Ala Lys Tyr Gly Tyr
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Asn Cys Val Tyr Leu Lys Cys Lys Cys Asn Gln
 35 40

<210> 229
 <211> 244
 <212> DNA
 <213> Centruroides noxius

<220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (133)..(244)
 <223>

<400> 229
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15
 tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga 96
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30
 acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40
 gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataagat tattaaattt 202
 ccgcacaaac caaccacaaaa aaagtatcga tcgtatcgta tc 244

<210> 230
 <211> 43
 <212> PRT
 <213> Centruroides noxius

<400> 230

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 231
 <211> 129
 <212> DNA
 <213> Centruroides noxius

<220>
 <221> CDS
 <222> (1)..(129)
 <223> Product= Erg-channel modifier toxin

<400> 231
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga 96
 Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca 129
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 232
 <211> 43
 <212> PRT
 <213> Centruroides noxius

<400> 232

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 233
 <211> 212
 <212> DNA
 <213> Centruroides noxius

<220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

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<220>
<221> 3'UTR
<222> (133)..(212)
<223>

<400> 233
gat aga gat agc tgt gtt gat aaa tca caa tgc gga aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr
1          5          10          15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gaa cgt gta gga      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly
          20          25          30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt      142
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
          35          40

gaattaagaa tatcaaagct ggaagctggt taagaagtga aaaataaaga ttattaaatt . 202

tccgcaaatt      212

<210> 234
<211> 43
<212> PRT
<213> Centruroides noxius

<400> 234
Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr
1          5          10          15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly
          20          25          30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
          35          40

<210> 235
<211> 129
<212> DNA
<213> Centruroides noxius

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin

<400> 235
gat aga gat agc tgt gtt gat aaa tca caa tgc gga aaa tat gga tac      48
Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr
1          5          10          15

tac ggt caa tgt gat gag tgt tgc aag aaa gct gga gaa cgt gta gga      96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly
          20          25          30

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acc tgc gtg tat tac aag tgt aaa tgt aac cca 129
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 236
 <211> 43
 <212> PRT
 <213> Centruroides noxius
 <400> 236

Asp Arg Asp Ser Cys Val Asp Lys Ser Gln Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Glu Arg Val Gly
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 237
 <211> 212
 <212> DNA
 <213> Centruroides noxius

<220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (133)..(212)
 <223>

<400> 237
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

tac caa gag tgt cag gat tgt tgc aag aat gct gga cac aat gga gga 96
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
 20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga ttattaaatt 202
 tccgcaaatt 212

<210> 238
 <211> 43
 <212> PRT
 <213> Centruroides noxius

<400> 238

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 239

<211> 129

<212> DNA

<213> Centruroides noxius

<220>

<221> CDS

<222> (1)..(129)

<223> Product= Erg-channel modifier toxin

<400> 239

gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

tac caa gag tgt cag gat tgt tgc aag aat gct gga cac aat gga gga 96
Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca 129
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 240

<211> 43

<212> PRT

<213> Centruroides noxius

<400> 240

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Glu Cys Gln Asp Cys Cys Lys Asn Ala Gly His Asn Gly Gly
20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 241

<211> 194

<212> DNA

<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (130)..(194)
<223>

<400> 241
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac caa gag tgt aca gat tgt tgc aag aaa tat gga cac aat ggg gga 96
Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
20 25 30

acc tgc atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat aaattaataa 149
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

tatcaaagct gtaagctatt tatgaagtga aaaataaaga ttatg 194

<210> 242
<211> 42
<212> PRT
<213> Centruroides elegans

<400> 242
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 243
<211> 126
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(126)
<223> Product= Erg-channel modifier toxin

<400> 243
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

-140-

tac caa gag tgt aca gat tgt tgc aag aaa tat gga cac aat ggg gga 96
Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
20 25 30

acc tgc atg ttt ttc aag tgt aaa tgt gcg 126
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 244
<211> 42
<212> PRT
<213> Centruroides elegans

<400> 244

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

<210> 245
<211> 197
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(132)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (133)..(197)
<223>

<400> 245
gat aga gat agc tgt gtt gat aaa tca aga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac caa cag tgt gaa att tgt tgc aag aaa gct gga cac aga gga gga 96
Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly
20 25 30

acc tgc gaa ttt ttc aag tgt aaa tgt aaa gta taa actcgaatgt 142
Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
35 40

gaattaagaa tatcaaagct gggaactggt tacgatgtga aaaataaaga ttatt 197

<210> 246
<211> 43

<212> PRT
<213> Centruroides elegans

<400> 246

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly
20 25 30

Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
35 40

<210> 247
<211> 129
<212> DNA
<213> Centruroides elegans

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin

<400> 247

gat aga gat agc tgt gtt gat aaa tca aga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac caa cag tgt gaa att tgt tgc aag aaa gct gga cac aga gga gga 96
Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly
20 25 30

acc tgc gaa ttt ttc aag tgt aaa tgt aaa gta 129
Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
35 40

<210> 248
<211> 43
<212> PRT
<213> Centruroides elegans

<400> 248

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gln Gln Cys Glu Ile Cys Cys Lys Lys Ala Gly His Arg Gly Gly
20 25 30

Thr Cys Glu Phe Phe Lys Cys Lys Cys Lys Val
35 40

<210> 249

<211> 196
 <212> DNA
 <213> Centruroides elegans

<220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (133)..(196)
 <223>

<400> 249
 gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15
 tat cat caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga 96
 Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30
 aac tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142
 Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40
 gaattaagaa tatgaaagat ggaagctggt taagaagtga aaaataaaga ttat 196

<210> 250
 <211> 43
 <212> PRT
 <213> Centruroides elegans

<400> 250
 Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
 1 5 10 15
 Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30
 Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 251
 <211> 129
 <212> DNA
 <213> Centruroides elegans

<220>
 <221> CDS
 <222> (1)..(129)
 <223> Product= Erg-channel modifier toxin

<400> 251

-143-

gat aga gat agc tgt gtt gat aaa tca aaa tgc gga aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

tat cat caa tgt gat gag tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

aac tgc gtg tat tac aag tgt aaa tgt aac cca 129
Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 252
<211> 43
<212> PRT
<213> Centruroides elegans

<400> 252

Asp Arg Asp Ser Cys Val Asp Lys Ser Lys Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr His Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Asn Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 253
<211> 193
<212> DNA
<213> Centruroides gracilis

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (130)..(193)
<223>

<400> 253
gat aga gat agc tgt gtt gat aaa tca cga tgc gcg aaa tat gga cac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly His
1 5 10 15

tac caa gag tgt acg gat tgt tgc aag aaa tac gga cac aat gga gga 96
Tyr Gln Glu Cys Thr Asp Cys Cys Lys Lys Tyr Gly His Asn Gly Gly
20 25 30

acc tgc atg ttc ttc aag tgt aaa tgt gcg taa actcgaagat gaattaataa 149
Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
35 40

tataaaagct gtaagctatt tacgaagtga aaaataaaga ttat 193

<210> 254
<211> 42
<212> PRT
<213> *Centruroides gracilis*

<400> 254

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	His
1				5					10					15	

Tyr	Gln	Glu	Cys	Thr	Asp	Cys	Cys	Lys	Lys	Tyr	Gly	His	Asn	Gly	Gly
			20					25					30		

Thr	Cys	Met	Phe	Phe	Lys	Cys	Lys	Cys	Ala
		35					40		

<210> 255
<211> 126
<212> DNA
<213> *Centruroides gracilis*

<220>
<221> CDS
<222> (1)..(126)
<223> Product= Erg-channel modifier toxin

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gcg	aaa	tat	gga	cac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	His	
1				5					10					15		

tac	caa	gag	tgt	acg	gat	tgt	tgc	aag	aaa	tac	gga	cac	aat	gga	gga	96
Tyr	Gln	Glu	Cys	Thr	Asp	Cys	Cys	Lys	Lys	Tyr	Gly	His	Asn	Gly	Gly	
			20					25					30			

acc	tgc	atg	ttc	ttc	aag	tgt	aaa	tgt	gcg							126
Thr	Cys	Met	Phe	Phe	Lys	Cys	Lys	Cys	Ala							
		35					40									

<210> 256
<211> 42
<212> PRT
<213> *Centruroides gracilis*

<400> 256

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Ala	Lys	Tyr	Gly	His
1				5					10					15	

Tyr	Gln	Glu	Cys	Thr	Asp	Cys	Cys	Lys	Lys	Tyr	Gly	His	Asn	Gly	Gly
			20					25					30		

Thr	Cys	Met	Phe	Phe	Lys	Cys	Lys	Cys	Ala
		35					40		

<210> 257
 <211> 193
 <212> DNA
 <213> *Centruroides gracilis*
 <220>
 <221> CDS
 <222> (1)..(129)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (130)..(193)
 <223>

<400> 257
 gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga aac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
 1 5 10 15
 tac gct cag tgt acg gcc tgt tgc aag aag gct gga cac aat aaa gga 96
 Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
 20 25 30
 acc tgc gac ttt ttc aag tgt aaa tgt acg taa tctcgaagaa gaattaatta 149
 Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
 35 40
 tatcaaagct tggaaccaat taccgaagtg gaaaaattaa gaat 193

<210> 258
 <211> 42
 <212> PRT
 <213> *Centruroides gracilis*

<400> 258
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
 1 5 10 15
 Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
 20 25 30
 Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
 35 40

<210> 259
 <211> 126
 <212> DNA
 <213> *Centruroides gracilis*
 <220>
 <221> CDS
 <222> (1)..(126)
 <223> Product= Erg-channel modifier toxin

<400> 259
 gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga aac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
 1 5 10 15

tac gct cag tgt acg gcc tgt tgc aag aag gct gga cac aat aaa gga 96
 Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
 20 25 30

acc tgc gac ttt ttc aag tgt aaa tgt acg 126
 Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
 35 40

<210> 260
 <211> 42
 <212> PRT
 <213> Centruroides gracilis

<400> 260
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Asn
 1 5 10 15

Tyr Ala Gln Cys Thr Ala Cys Cys Lys Lys Ala Gly His Asn Lys Gly
 20 25 30

Thr Cys Asp Phe Phe Lys Cys Lys Cys Thr
 35 40

<210> 261
 <211> 197
 <212> DNA
 <213> Centruroides gracilis

<220>
 <221> CDS
 <222> (1)..(141)
 <223> Product= Erg-channel modifier toxin precursor
 In the mature peptide, the last Ser is amidated, and the last Gly
 and the last basic aminoacid are cut

<220>
 <221> 3'UTR
 <222> (142)..(197)
 <223>

<400> 261
 gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga ccc 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro
 1 5 10 15

tac gga cag tgt acg gac tgt tgc aag aaa gct gga cac act gga gga 96
 Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly
 20 25 30

acc tgc ata tat ttc aag tgt aaa tgt ggc gca gaa agt gga aga 141
 Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser Gly Arg

35 40 45
tgaatttata atatcaaagc tgtaagctat ttacgaagtg aaaaataaag attatt 197

<210> 262
<211> 47
<212> PRT
<213> Centruroides gracilis

<400> 262

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro
1 5 10 15

Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly
20 25 30

Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser Gly Arg
35 40 45

<210> 263
<211> 135
<212> DNA
<213> Centruroides gracilis

<220>
<221> CDS
<222> (1)..(135)
<223> Product= Erg channel modifier toxin

<400> 263
gat aga gat agc tgt gtt gat aaa tca cga tgc caa aaa tat gga ccc 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro
1 5 10 15

tac gga cag tgt acg gac tgt tgc aag aaa gct gga cac act gga gga 96
Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly
20 25 30

acc tgc ata tat ttc aag tgt aaa tgt ggc gca gaa agt 135
Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser
35 40 45

<210> 264
<211> 45
<212> PRT
<213> Centruroides gracilis

<400> 264
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gln Lys Tyr Gly Pro
1 5 10 15

Tyr Gly Gln Cys Thr Asp Cys Cys Lys Lys Ala Gly His Thr Gly Gly
20 25 30

Thr Cys Ile Tyr Phe Lys Cys Lys Cys Gly Ala Glu Ser
 35 40 45

<210> 265
 <211> 194
 <212> DNA
 <213> Centruroides sculpturatus

<220>
 <221> CDS
 <222> (1)..(129)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (130)..(194)
 <223>

<400> 265
 gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
 1 5 10 15
 tac caa gag tgt cag gat tgt tgc aag aaa gct gga cat aat gga gga 96
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
 20 25 30
 acc tgt atg ttt ttc aag tgt aaa tgt gcg taa actcgaagat gaattaataa 149
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
 35 40
 tatcaaagct gtaagctatt tatgaagtga aaaataaaga ttatt 194

<210> 266
 <211> 42
 <212> PRT
 <213> Centruroides sculpturatus

<400> 266
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
 1 5 10 15
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
 20 25 30

Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
 35 40

<210> 267
 <211> 126
 <212> DNA
 <213> Centruroides sculpturatus

<220>

<221> CDS
 <222> (1)..(126)
 <223> Product= Erg-channel modifier toxin

<400> 267
 gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
 1 5 10 15
 tac caa gag tgt cag gat tgt tgc aag aaa gct gga cat aat gga gga 96
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
 20 25 30
 acc tgt atg ttt ttc aag tgt aaa tgt gcg 126
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
 35 40

<210> 268
 <211> 42
 <212> PRT
 <213> Centruroides sculpturatus

<400> 268
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
 1 5 10 15
 Tyr Gln Glu Cys Gln Asp Cys Cys Lys Lys Ala Gly His Asn Gly Gly
 20 25 30
 Thr Cys Met Phe Phe Lys Cys Lys Cys Ala
 35 40

<210> 269
 <211> 197
 <212> DNA
 <213> Centruroides sculpturatus

<220>
 <221> CDS
 <222> (1)..(132)
 <223> precursorProduct= Erg-channel modifier toxin

<220>
 <221> 3'UTR
 <222> (133)..(197)
 <223>

<400> 269
 gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
 1 5 10 15
 tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aga gga gga 96
 Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly
 20 25 30

acc tgc gat ttt ttc aag tgt aaa tgt aaa gta taa actcgaatgt 142
Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val
35 40

gaattaagaa tatcaaagct gggaactggt tacgaagtga aaaataaaga ttttg 197

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<210> 270
<211> 43
<212> PRT
<213> Centruroides sculpturatus

<400> 270
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Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly
20 25 30

Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val
35 40

```
<210> 271
<211> 129
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel mod
```

<400> 271
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aga gga gga 96
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly
 20 25 30

acc tgc gat ttt ttc aag tgt aaa tgt aaa gta 129
Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val
35 40

```
<210> 272
<211> 43
<212> PRT
<213> Centruroides sculpturatus
<400> 272
```

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

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Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Arg Gly Gly
 20 25 30

Thr Cys Asp Phe Phe Lys Cys Lys Cys Lys Val
 35 40

<210> 273
 <211> 197
 <212> DNA
 <213> Centruroides sculpturatus

<220>
 <221> CDS
 <222> (1)..(132)
 <223> Product= Erg-channel modifier toxin precursor

<220>
 <221> 3'UTR
 <222> (133)..(197)
 <223>

<400> 273
 gat aga gat agc tgt gtt gat aaa tca cga tgc gga aaa tat gga tac 48
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

tac ggt caa tgt gat gac tgt tgc aag aaa gct gga gac cgt gca gga 96
 Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142
 Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

gaattaagaa tatcaaagct ggaagctggt taagaagtga aaaataaaga ttatt 197

<210> 274
 <211> 43
 <212> PRT
 <213> Centruroides sculpturatus

<400> 274
 Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr
 1 5 10 15

Tyr Gly Gln Cys Asp Asp Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
 20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
 35 40

<210> 275
 <211> 129
 <212> DNA

<213> Centruroides sculpturatus

<220>

<221> CDS

<222> (1)..(129)

<223> Product= Erg-channel modifier toxin

<400> 275

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gga	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Gly	Lys	Tyr	Gly	Tyr	
1				5					10					15		

tac	ggt	caa	tgt	gat	gac	tgt	tgc	aag	aaa	gct	gga	gac	cgt	gca	gga	96
Tyr	Gly	Gln	Cys	Asp	Asp	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly	
			20					25					30			

acc	tgc	gtg	tat	tac	aag	tgt	aaa	tgt	aac	cca						129
Thr	Cys	Val	Tyr	Tyr	Lys	Cys	Lys	Cys	Asn	Pro						
		35					40									

<210> 276

<211> 43

<212> PRT

<213> Centruroides sculpturatus

<400> 276

Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Gly	Lys	Tyr	Gly	Tyr
1				5					10					15	

Tyr	Gly	Gln	Cys	Asp	Asp	Cys	Cys	Lys	Lys	Ala	Gly	Asp	Arg	Ala	Gly
			20					25					30		

Thr	Cys	Val	Tyr	Tyr	Lys	Cys	Lys	Cys	Asn	Pro
		35					40			

<210> 277

<211> 195

<212> DNA

<213> Centruroides sculpturatus

<220>

<221> CDS

<222> (1)..(132)

<223> Product= Erg-channel modifier toxin precursor

<220>

<221> 3'UTR

<222> (133)..(195)

<223>

<400> 277

gat	aga	gat	agc	tgt	gtt	gat	aaa	tca	cga	tgc	gga	aaa	tat	gga	tac	48
Asp	Arg	Asp	Ser	Cys	Val	Asp	Lys	Ser	Arg	Cys	Gly	Lys	Tyr	Gly	Tyr	
1				5					10					15		

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tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca taa actcgaatgt 142
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

gaattaagaa tatcaaagct ggaagctgtt taagaagtga aaaataaaga tta 195

<210> 278
<211> 43
<212> PRT
<213> Centruroides sculpturatus

<400> 278

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 279
<211> 129
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (1)..(129)
<223> Product= Erg-channel modifier toxin

<400> 279
gat aga gat agc tgt gtt gat aaa tca cga tgc gga aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr
1 5 10 15

tac ggt caa tgt gat gaa tgt tgc aag aaa gct gga gac cgt gca gga 96
Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

acc tgc gtg tat tac aag tgt aaa tgt aac cca 129
Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 280
<211> 43
<212> PRT
<213> Centruroides sculpturatus

<400> 280

-154-

Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Gly Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Asp Glu Cys Cys Lys Lys Ala Gly Asp Arg Ala Gly
20 25 30

Thr Cys Val Tyr Tyr Lys Cys Lys Cys Asn Pro
35 40

<210> 281
<211> 192
<212> DNA
<213> Centruroides sculpturatus

<220>
<221> CDS
<222> (1)..(144)
<223> Product= Erg-channel modifier toxin precursor

<220>
<221> 3'UTR
<222> (145)..(192)
<223>

<400> 281
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aat gga gga 96
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
20 25 30

acc tgt atg ttt ttc aag tgt atg tgc gta aac tcg aag atg aat taa 144
Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
35 40 45

taatatcaaa gctgtaagct atttatgaag tgaaaaataa agattatt 192

<210> 282
<211> 47
<212> PRT
<213> Centruroides sculpturatus

<400> 282
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
20 25 30

Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
35 40 45

<210> 283
<211> 141
<212> DNA
<213> *Centruroides sculpturatus*

<220>
<221> CDS
<222> (1)..(141)
<223> Product= Erg-channel modifier toxin

<400> 283
gat aga gat agc tgt gtt gat aaa tca cga tgc gca aaa tat gga tac 48
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

tac ggt caa tgt gaa gtt tgt tgt aag aaa gct gga cat aat gga gga 96
Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
20 25 30

acc tgt atg ttt ttc aag tgt atg tgc gta aac tcg aag atg aat 141
Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
35 40 45

<210> 284
<211> 47
<212> PRT
<213> *Centruroides sculpturatus*

<400> 284
Asp Arg Asp Ser Cys Val Asp Lys Ser Arg Cys Ala Lys Tyr Gly Tyr
1 5 10 15

Tyr Gly Gln Cys Glu Val Cys Cys Lys Lys Ala Gly His Asn Gly Gly
20 25 30

Thr Cys Met Phe Phe Lys Cys Met Cys Val Asn Ser Lys Met Asn
35 40 45

<210> 285
<211> 24
<212> DNA
<213> Artificial

<220>
<223> PCR Reverse oligonucleotide primer

<220>
<221> misc_feature
<222> (23)..(23)
<223> n is a, t, g, or c

<220>
<221> primer_bind
<222> (1)..(24)
<223> oligonucleotide T22NN

<220>
 <221> misc_feature
 <222> (24)..(24)
 <223> n is a, t, g, or c

<400> 285
 tttttttttt tttttttttt tttn

24

<210> 286
 <211> 25
 <212> DNA
 <213> Artificial

<220>
 <223> PCR Direct oligonucleotide primer

<220>
 <221> misc_feature
 <222> (24)..(24)
 <223> y is c or t

<220>
 <221> primer_bind
 <222> (1)..(25)
 <223> Oligonucleotide D1

<400> 286
 gagatgaatt cggtgttgat gatya

25

<210> 287
 <211> 22
 <212> DNA
 <213> Artificial

<220>
 <223> PCR Reverse oligonucleotide primer

<400> 287
 gcaattaaga agcgttaca ta

22

<210> 288
 <211> 16
 <212> DNA
 <213> Artificial

<220>
 <223> PCR Direct oligonucleotide primer

<220>
 <221> misc_feature
 <222> (2)..(2)
 <223> m is a or c

<220>

<221> primer_bind
<222> (1)..(16)
<223> Direct oligonucleotide CexD2

<220>
<221> misc_feature
<222> (5)..(5)
<223> r is a or g

<220>
<221> misc_feature
<222> (9)..(9)
<223> r is a or g

<400> 288
gmaarggarg gttatc

16

<210> 289
<211> 16
<212> DNA
<213> Artificial

<220>
<223> PCR Direct oligonucleotide primer

<220>
<221> misc_feature
<222> (1)..(1)
<223> r is a or g

<220>
<221> primer_bind
<222> (1)..(16)
<223> Direct oligonucleotide CexD3

<220>
<221> misc_feature
<222> (16)..(16)
<223> b is c or g

<220>
<221> misc_feature
<222> (7)..(7)
<223> s is c or g

<400> 289
raaggasggt tatccb

16

<210> 290
<211> 17
<212> DNA
<213> Artificial

<220>
<223> PCR Reverse oligonucleotide primer

<220>
<221> primer_bind
<222> (1)..(17)
<223> Reverse Oligonucleotide ErgR1

<220>
<221> misc_feature
<222> (2)..(2)
<223> m is a or c

<220>
<221> misc_feature
<222> (1)..(1)
<223> m is a or c

<400> 290
mmtaatcttt atttttc

17

<210> 291
<211> 17
<212> DNA
<213> Artificial

<220>
<223> PCR Reverse oligonucleotide primer

<220>
<221> primer_bind
<222> (1)..(17)
<223> Reverse Oligonucleotide ErgR2

<220>
<221> misc_feature
<222> (16)..(16)
<223> m is a or c

<220>
<221> misc_feature
<222> (17)..(17)
<223> m is a or c

<400> 291
aatttgcgga aatttmm

17

<210> 292
<211> 27
<212> DNA
<213> Artificial

<220>
<223> PCR Direct oligonucleotide primer

<220>
<221> primer_bind
<222> (1)..(27)
<223> Direct oligonucleotide ErgD1

<400> 292
gatagagata gctgtgttga taaatca

27

<210> 293
<211> 24
<212> DNA
<213> Artificial

<220>
<223> PCR Direct oligonucleotide primer

<220>
<221> primer_bind
<222> (1)..(24)
<223> Oligonucleotide

<220>
<221> primer_bind
<222> (1)..(24)
<223> Direct oligonucleotide

<400> 293
atgaaagaag gttatctggt aaac

24

<210> 294
<211> 24
<212> DNA
<213> Artificial

<220>
<223> PCR Reverse oligonucleotide primer

<220>
<221> primer_bind
<222> (1)..(24)
<223> Reverse oligonucleotide

<400> 294
ttagctgcaa gatttattag gaag

24